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2 Assessment of Appreciation of Humor: Studies With the 3 WD Humor Test

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Humor tests have a long tradition in psychology and have served different functions. First, it was recognized that humor is an important part of the human personality, and instruments measuring this trait had to be constructed. A second use emerged after discovering the close connection between an individual's humor and personality. In this tradition, appreciation of humor served as an "objective" test of personality. Under the guise of assessing one's sense of humor, the scores were also used to draw inferences about an individual's location on personality dimensions like intelligence, extraversion, or anxiety. Third, tests were used to establish taxonomies of humor and to test their validity. For example, it was investigated whether the categories used are exhaustive and stable across cultures. Fourth, humor inventories were constructed to test existing theories of humor. For example, if a theory assumes that repressed drives find relief in humor, typically the constructed inventories contain categories of sexual and aggressive humor. Studies then examined whether arousal of the motive leads to enhanced appreciation of the respective humor category, or whether appreciation of humor of a certain category leads to reduction of the respective drive. Fifth, humor inventories were used to test theories of personality or of other factors influencing appreciation of humor. If one, for example, assumes that sensation seeking predicts the liking of stimuli of different intensity, complexity, novelty, or incongruity in general, the validity of the model underlying this trait is tested in the realm of humor by choosing humor categories that vary along these parameters. Sixth, humor inventories were used to test general theories in the field of humor appreciation. In this context, humor tests served to examine the roles of

autonomic arousal and cognition in the genesis of emotions, the functional specialization of the hemispheres, or the effects of crowding on mood. Finally, humor tests were used in emotion research as induction methods for studying smiling-laughter and positive emotions, such as exhilaration or joy. In this approach the emotional responses to humor are the main focus, and items from humor tests are used in order to have a representative set of stimuli.

THEORY AND RESEARCH ON THE NATURE AND ASSESSMENT OF HUMOR

Despite the wide use of humor tests, the state of the art of assessment of humor appreciation has not developed very far. In most of the investigations, the "humor test" used is an ad hoc measure of unknown psychometric properties. Most frequently, a couple of jokes and cartoons was employed, which were selected by several "experts" as being representative for certain theoretical humor categories. Neither an empirical test of the homogeneity of these scales was applied nor an investigation of the validity or the comprehensiveness of the categories used was undertaken. Most frequently, the Freudian categories of harmless, sexual, and aggressive humor were used. Some of these humor measures were employed by one author only, or, even worse, by one author in one study only. Consequently, results obtained in different studies were not comparable, and thus this approach did not lead to much accumulation of knowledge on the nature of humor.

A Pioneer

Other instruments are based on more careful and solid work. In this tradition, factor analysis was used to derive an exhaustive taxonomy of humor. Next, guided by psychometric principles, scales were designed and validity studies were undertaken. As an example of this approach, the IPAT Humor Test of Personality (Cattell & Tollefson, 1966) deserves to be mentioned. This humor test is based on factor analytic studies of humor by Cattell and colleagues as well as by other researchers (Andrews, 1943; Cattell & Luborsky, 1947; Eysenck, 1942, 1943; Yarnold & Berkeley, 1954). Cattell arrived at a taxonomy of humor consisting of 12 factor analytically derived categories that should not only provide a profile of an individual's humor but also an assessment of dynamic or temperamental dimensions. For example, humor factor 1 ("anxious considerateness vs. debonair sexual and general uninhibitedness") is considered to be synonymous with the second-order questionnaire factor of extraversion. This assumption is based on the correlation of this scale with the 16PF markers of extraversion, A

(cyclothymia), F (surgency), and H (venturesomeness). In addition to the 12 humor factors, a further scale (Factor 13: dullness vs. general intelligence) was added to measure, roughly, general intelligence. These items were initially selected on the basis of their correlation with intelligence measures.

The final version of the IPAT humor test consists of two forms: Form A, employing eight pairs of jokes for each of the 13 factors (104 items) and utilizing a "forced choice" design; and Form B, comprised of 10 items per factor to be rated individually (130 items). Whereas in Form A subjects indicate which of the pair is *funnier*, in Form B they mark whether they consider the joke or cartoon as *funny* or *dull* (i.e., above or below their average) after being instructed to use each of the two labels about equally frequently. For both forms there is a test booklet containing the jokes and cartoons and a separate answer sheet. Separate norms for male and female high school and college students are added. The test is considered to be suitable for individual and group administration. For the latter there is the instruction not to disturb others by laughing aloud or attempting to share a joke. Split-half coefficients are between .18 and .50, stability coefficients for an interval of 2 weeks are between .20 and .58, and the correlations between the two forms range between .19 and .43.

Despite the efforts spent for the construction of the test, the IPAT humor test today plays a minor role in contemporary research on both personality and humor. Although the humor test was used in several studies (e.g., Breme, 1976; Carroll, 1989; Mones, 1974; Saper, 1984), its overall impact is low and seems to be obsolete. Considering contemporary knowledge on the assessment of humor, one can assume that the selected "forced choice" answer format is responsible for the problems with the IPAT humor test, such as the apparent overextraction, preoccupation with minor sources of variance, neglect of structural characteristics in humor, lack of reliability, or unproved validity. Cattell and Tollefson applied these answer formats because they assumed that the shape of the profile (i.e., the preference for certain humor categories) already contains the relevant information, whereas the interindividual differences in the level of the profile are irrelevant. However, this format eliminated the strong factors and thus probably hindered the discovery that the first factors appearing in factor analysis of jokes and cartoons are characterized by the items *structure* and not by their *content*. Ruch (1981, 1984) as well as Herzog and Larwin (1988) reported the existence of one or two factors appearing that deal with a variety of themes but are characterized by similar structure. The common denominator of these jokes and cartoons refers to similar cognitive processes rather than to thematic content. Whereas the format hindered the extraction of major humor factors, it raised the relative importance of minor sources of variance, which apparently are less reliable as reflected in the coefficients reported earlier. The absence of strong factors impaired the

distinction in major and minor sources of variance. The overextraction can be seen in the facts that in subsequent studies between three and four meaningful factors were extracted and that, with the possible exception of the sexual humor category, no other of Cattell's factors was replicated. The answer format also seems to be responsible for a further specificity of the IPAT humor test, the bipolarity of the humor dimensions. There is a convergence in the results of the studies from Andrews (1943) onward. Whenever there is no restriction in the number of items one is allowed to find funny, the overwhelming majority of the intercorrelations between pairs of jokes or cartoons are positive, and negative coefficients seldomly exceed the value of $-.20$. As a consequence, only unipolar factors appear and tend to be orthogonal or positively correlated but never negatively correlated.

Despite the persuasive arguments favoring humor tests as a means for the objective assessment of personality, the IPAT humor test has not found widespread use in personality research. Maybe this is due to the failure of Cattell and Tollefson to present convincing tables of correlation coefficients showing that the relationship between humor and personality is strong and replicable. From the perspective of humor research, the explicit link to theory is also lacking. The work of Cattell and colleagues was stimulated by the Freudian (1905) hypothesis that repressed needs find relief in jokes. Thus, they expected that application of factor analysis will help to find such repressed areas in the realm of humor. Whereas some factors (e.g., Factor 5: urbane pleasantness vs. hostile derogation) relate to sex or aggression and thus have face validity, others (e.g., Factor 10: cheerful independence vs. mistreatment humor) are less easily integrated in taxonomies of needs. Thus, there are no apparent links between humor categories measured by the IPAT humor test and general humor theories, especially because influence of Freudian thinking on humor research ceased and alternative theories were developed (see McGhee, 1979).

The Current Standard in the Assessment of Appreciation of Humor

Although the IPAT humor test now seems to be obsolete, its basic ideas have been taken up and pursued by more recent humor tests. The use of factor analysis to derive a taxonomy of humor and the belief that the appreciation of humor reflects aspects of personality continues to inspire research. However, the investigation of individual differences in humor is presently more integrated into general humor research than in the pioneer years. There is a fruitful mutual exchange between general humor theories and taxonomic studies of humor.

Ruch (1980) proposed that a comprehensive assessment of humor should

not only cover a taxonomy of humor stimuli but also an investigation of the dimensionality of the responses to humor. The taxonomy of humor stimuli was achieved by a set of factor analytic studies of differing but overlapping sets of jokes and cartoons. In order to get a robust taxonomy, samples differing with regard to sex, age, occupation, health status, and other variables were used. Most importantly, the first construction samples covered Austrian as well as German subjects. After establishing the taxonomy, the items were translated into English, French, Hebrew, Russian, and Turkish in order to be able to test its cross-cultural stability. Similarly, the dimensions of appreciation were obtained by correlational and factor analytic studies of several rating scales covering different aspects of the responses to humor.

A Taxonomy of Jokes and Cartoons

Structure and Content as Ingredients in Humor. Factor analytic studies showed that structural properties of jokes and cartoons are at least as important as their content. Two of the three factors extracted consistently are based on the structure of cartoons and jokes, not on their content (Ruch, 1981, 1984; Ruch & Hehl, 1984, 1986b). These two factors are defined as *incongruity-resolution* (INC-RES) humor and *nonsense* (NON) humor. The jokes and cartoons of these two factors deal with a variety of topics (except sex), but they are similar to each other with respect to the cognitive processes involved. The third factor, *sexual* (SEX) humor, may be based on one structure or the other but is homogeneous with respect to the sexual content involved.

The extraction of an *incongruity-resolution* structure factor is a noteworthy finding, because it confirms the significance of both incongruity and resolution information in humor as stressed in theoretical models of humor (Bariaud, 1983; Schiller, 1938; Shultz, 1972; Suls, 1972). There is general agreement about the existence of this two-stage structure in the process of perceiving and understanding humor (McGhee, Ruch, & Hehl, 1990). Jokes and cartoons of this humor category are characterized by punchlines in which the surprising incongruity can be completely resolved. The common element in this type of humor is that the recipient first discovers an incongruity that is then fully resolvable upon consideration of information available elsewhere in the joke or cartoon. Although individuals might differ with respect to how they perceive and-or resolve the incongruity, they have the sense of having "gotten the point" or understood the joke once resolution information has been identified.

The other consistently emerging structural factor is *nonsense* humor, which also has a surprising or incongruous punchline, exactly as in incongruity-resolution humor. However, according to McGhee et al.

(1990), "the punchline may (1) provide no resolution at all, (2) provide a partial resolution (leaving an essential part of the incongruity unresolved), or (3) actually create new absurdities or incongruities" (p. 124). In nonsense humor the resolution information gives the appearance of making sense out of incongruities without actually doing so (see also Rothbart & Pien, 1977). Nonsense humor should not be confused with the so-called "innocent" humor, because it refers to the typical structure of humor rather than to a harmless content. Both the incongruity-resolution and the nonsense structure can be the basis for harmless as well as tendentious content (as in the case of sexual humor).

The *sexual humor* category was initially the easiest to identify due to its salient content. Furthermore, it was the only one of the three factors that was expected to appear, because a factor of sexual humor has been found in all factor analytic studies from Eysenck (1942) to Herzog and Larwin (1988). Subsequently, however, sex jokes and cartoons typically have two loadings: one on the sexual humor factor and a second one on one of the two structure factors. The size of this second loading seems to depend on the degree of the theme's salience. In very explicit items (mostly cartoons) the loading on the structure factor is very low, whereas in less salient items the loadings on the content and structure factor can be of about equal size. Thus, one has to distinguish between a *factor of sexual humor*, which is composed of the content variance of the sexual jokes and cartoons only (bereft of the structure variance), and the *sexual humor category* (as used in humor tests), in which both content *and* structure are involved. Whereas a sexual humor factor usually is orthogonal to the two structure factors, the sexual humor category correlates with nonsense and incongruity-resolution humor due to the structure overlap.

According to their loading patterns, the items of the general sexual humor category roughly can be subdivided into three classes of "pure" sexual humor (in which the content largely overpowers the structure), incongruity-resolution-based sexual humor, and nonsense-based sexual humor. The validity of the separation of the two structure-based subgroups of sexual humor is supported by their different correlational profiles, not only with the general structure categories but also with personality dimensions.

These three humor factors are considered to provide an exhaustive taxonomy in classifying jokes and cartoons at a general level. They consistently explain approximately 40% of the total variance (Ruch, 1981, 1984; Ruch, Accoce, Ott, & Bariaud, 1991).

Dimensions of Appreciation

Factor analysis has also been used to investigate the dimensionality of the responses to humor (Ruch, 1981; Ruch, Rath, & Hehl, 1988). The results

suggest that the appreciation of humor is defined by two nearly orthogonal components of *positive* and *negative* responses that are best represented by ratings of "funniness" and "aversiveness" (in former studies called *rejection*). Maximal appreciation of jokes and cartoons consists of high funniness and low aversiveness, whereas minimal appreciation occurs if the joke is not considered funny but is found aversive. However, a joke can also be considered not funny but be far from being aversive; or it can make one laugh although there are certain annoying aspects (e.g., one can consider the punchline original or clever but dislike the content of the joke).

The necessity of an empirical separation of positive and negative responses first emerged from a three-mode factor analysis in which ratings of the degree of funniness, induced exhilaration, laughter, and liking formed one factor and the rating of the degree of rejection of the jokes and cartoons formed the other (Ruch, 1980). In a subsequent study (Rath, 1983), it turned out that all positively toned ratings tended to intercorrelate highly positive, independently of whether they referred to the perceived properties of the stimuli (funny, witty, original) or to the recipients feelings (exhilarated, amused). Negative ratings also intercorrelated. A factor analysis of these data (Ruch et al., 1988) yielded a strong "funniness" factor covering all eight positive response scales but not the nine negatively toned scales. The latter tended to fall into two clusters, representing milder (e.g., plain, feel bored) and stronger (e.g., tasteless, feel angered) forms of aversive reactions. Because they were highly correlated, it was not considered necessary to separate them. Therefore, the negative responses are represented in the humor test by one negative scale only.

Development of the Taxonomy of Humor

There were several stages in the construction of the taxonomy that finally led to the 3 WD (*Witz-Dimensionen*) humor test (Ruch, 1983). The initial sample of jokes and cartoons comprised 600 items selected from very different sources in order to obtain a representative pool. Some were recruited to represent humor categories discussed in the literature, others were selected randomly. For a first-factor analytic study, every sixth was chosen on a random basis (Ruch, 1980). These 100 jokes and cartoons were given to 156 subjects who were asked to rate them on a 7-point scale ranging from "not at all funny" to "very funny," and to mark whether the cartoons and jokes were already known or not. This pool of items was subsequently reduced to 48 on the basis of the factor analytic results. Widely known jokes were deleted, too. The subsequent main study used a fairly representative sample of 110 Austrian adults, who rated each of these 48 jokes and cartoons on 7-point scales according to five criteria (degree of funniness, rejection, exhilaration, laughter, and liking). A three-mode factor analysis

was performed and yielded the three orthogonal humor stimulus factors described earlier, two humor response factors of funniness and aversiveness, and four bipolar person factors (Ruch, 1981).

In order to test whether additional dimensions needed to be extracted, a new large pool of humor items was assembled that consisted of jokes and cartoons expected to be either good or poor representatives of the three categories. A third experimental version of the humor test was created consisting of 46 of the 48 items from the previous study and 74 drawn randomly from the newly established pool. This version with 120 jokes and cartoons was administered to four German and Austrian samples containing approximately 700 subjects altogether, who were tested individually in order to avoid social influences (Ruch & Hehl, 1984). In order to prevent overstimulation and boredom, the 120 items were distributed among six test booklets and administered on different occasions. Each set of 20 items was preceded by three "warm-up" items, which were not considered in the analyses.

The same three humor categories emerged again in these four samples, and serial rotations with 4 to 10 factors confirmed that it was not necessary to expand the 3 WD test to include new factors (Ruch, 1984). Pairwise comparison of the factor loadings for these samples revealed a highly replicable structure. The cosines between the varimax matrices of two German samples suggested identity of the corresponding factors (coefficients of $> .998$), and Tucker's congruence coefficient, a further measure of stability of factor patterns, yielded high coefficients too: .97 for incongruity-resolution, and .94 for nonsense and sexual humor.

Cross-National Stability of the Humor Factors. When comparing the varimax rotated loading matrices of one German and two Austrian samples of young adults, the cosines between the factor patterns suggested high cross-national stability for the humor factors of incongruity-resolution (.99, .99), nonsense (.98, .97), and sexual (.97, .97) humor (Ruch & Hehl, 1984). Evidence for cross-national stability of this humor taxonomy was later also found in samples of 115 German and 139 French students using the final humor test (Accoce, 1986; Ruch et al., 1991). The cosines for the respective factors in German and French adults were .98, .98, and .99; Tucker's congruence coefficient yielded coefficients of .88, .91, and .93. It is possible that additional factors might appear in humor material in the countries investigated. The intrinsic structure in this set of jokes and cartoons, however, is essentially identical in the European countries investigated hitherto. Support for the significance of these factors has also been obtained in a sample of 260 Turkish subjects (Ciftci, 1990) and in an American sample (McGhee, unpublished results).

State Variance in Appreciation of Humor? There is evidence that situational factors and mood contribute to the responses to humor.

However, they only explain between 5% and 7% of the variance, and this variance can be reduced by suitable precautions. In the factor analyses of the 120-item pool, two additional factors appeared that altogether explained 6.6% of the total variance. Whereas the loadings on the "warm-up" factor decreased from the first to approximately the tenth joke, the "end of test" factor was loaded by the last 15 items only (again with increasing size of the loadings). The factor pattern of these items with respect to the first three factors was clearly interpretable albeit lower in size. These sources of variance were eliminated in the final humor test by raising the number of practice items to 5 and by reducing the total number of items.

Furthermore, "testing time" factors were extracted from funniness (explaining 5.30% of the variance) and aversiveness (6.21%) ratings of two sets of 10 items administered to 4,292 subjects approximately 1 month apart (Ruch, McGhee, & Hehl, 1990). Independent of their category, the jokes and cartoons administered at the first testing time loaded negatively, and the items of the second set loaded positively on the testing time factor. These effects might be specific for the circumstances of that study, because only one warm-up item was employed and no experimenter was present to assure equal testing conditions between occasions. Finally, a cheerfulness scale administered immediately before presenting the items of the humor test (via slides) correlated consistently positive (.20) albeit nonsignificant with the funniness rating in two samples (Ruch, 1990). Whereas the correlations with facial responses were higher, they were significant only when a further subject or the experimenter was present under mere presence conditions.

Thus, in order to eliminate the state variance, it is important to administer the 3 WD humor test under standardized testing conditions: Subjects are tested individually, and during the administration of the 3 WD the experimenter is either absent or, for the subjects visible, engaged in other activities and not paying attention to the subjects.

CONSTRUCTION AND PSYCHOMETRIC PROPERTIES OF THE 3 WD

The 3 WD Humor Test

The 3 WD ("3 Witz-Dimensionen") humor test (Ruch, 1983) was designed to assess funniness and aversiveness of jokes and cartoons of the three humor categories of incongruity-resolution humor, nonsense humor, and sexual humor.¹ Three versions of the test (3 WD-K, 3 WD-A, and 3 WD-B) exist. They contain 50 (Form K) or 35 (Forms A and B) jokes and cartoons, which are rated on "funniness" and "aversiveness" using two 7-point scales. The

¹Copies of international versions of this test may be obtained by writing to the author.

funny rating ranges from *not at all funny* = 0 to *very funny* = 6, and the aversiveness scale ranges between *not at all aversive* = 0 to *very aversive* = -6. Forms A and B are parallel tests. They are used together as a long form (with 60 items scored) when reliable measurement is needed, or as parallel versions before and after an intervention whose effects have to be evaluated. Form A and B do not overlap, but their purest items form the 3 WD-K, which is a short form. The first five items of each form are used for "warming up" and are not scored. The jokes and cartoons are presented in a test booklet with two or three items on a page. The instructions are typed on the separate answer sheet that also contains the two sets of rating scales.

Six scores can be derived from each form of the test: three for funniness of incongruity-resolution, nonsense, and sexual humor (i.e., INC-RES_f, NON_f, and SEX_f) and three for their aversiveness (i.e., INC-RES_a, NON_a, and SEX_a). These six scores describe an individual's sense of humor at a general level.

As mentioned previously, sometimes the three subcategories of "pure" sexual humor (PURE SEX), incongruity-resolution-based sexual humor (INC-RES SEX), and nonsense-based sexual humor (NON SEX) are used in addition to the general sexual humor category. Other indices have been derived as well and were validated in several studies (Ruch, 1988; Ruch & Hehl, 1988; Ruch et al., 1990). For example, a *structure preference index* was obtained by subtracting INC-RES_f from NON_f. Similarly, the funniness and aversiveness scores of a humor type could be combined to form a more general *appreciation* score.

Construction of the 3 WD Humor Test

The 3 WD humor test (Ruch, 1983) was constructed on the basis of the factor analytic and item analytic results obtained for the four Austrian and German samples described earlier. Those of the 120 jokes and cartoons that showed a stable factor pattern across the four samples were selected for the final version of the test. Furthermore, in order to obtain parallel forms, an attempt was made to get pairs of jokes and of cartoons matched for content, mean funniness, loading pattern, and style (verbal or pictorial with or without caption). Then one of the pair was used in Form A and the other in Form B.

Psychometric Properties of the 3 WD

A first evaluation of the psychometric properties was done on the data used in the factor analysis (Ruch & Hehl, 1984). Since then, the different forms of the 3 WD were used in several studies with Austrian and German

samples, and therefore information regarding the inventory's psychometric properties is available.

Characteristics of the Scales. Table 2.1 presents the means and standard deviations of the six scales obtained for Form K and the parallel Forms A and B separately and combined. With the exception of one Turkish sample (Ciftci, 1990), all subjects were Austrian or German.

Table 2.1 shows that, whereas the three humor categories are roughly comparable with respect to funniness, the sexual humor category is much higher in aversiveness than the two structure-based humor categories. Analysis of the distribution of the scores reveals that there is no deviation from normality for all three funniness scales and for aversiveness of sexual humor. Because many subjects do not find the structural humor categories aversive at all, there is a skewness in these distributions that is significant in some samples (especially when Forms A and B are studied separately).

Review of several studies (Ruch & Hehl, 1985) and the results of a large-scale study (Ruch et al., 1990) unequivocally reveal that there are no sex differences in funniness or aversiveness of incongruity-resolution or nonsense humor. There is, however, a tendency for males to give higher funniness and lower aversiveness ratings to sexual humor (Ruch & Hehl, 1985). Whereas this difference can be found consistently, the effect is small and the coefficients are not always significant. It can be assumed that this difference is due to the sexual content of the jokes and cartoons of this category rather than to its structural basis. There are no data from the 3 WD humor pool allowing for an estimate of whether this effect holds for all types of sexual themes or only for those that involve sexism. The difference is in agreement with the sex differences found for predictors of sexual humor (see following).

There was no detailed study of age differences in appreciation of sexual humor. A review of correlation coefficients obtained for several samples suggests no such effect (Ruch & Hehl, 1985). Age differences in appreciation of the structural humor categories were studied more extensively (McGhee et al., 1990; Ruch et al., 1990). Although the age differences of the 11 age groups studied cannot be described by only linear trends, one roughly can say that INC-RES_f increases with increasing age, whereas NON_f and aversiveness of both structure dominated humor categories tends to decrease during the life span.

Reliability of the 3 WD Scales. Reliability estimates are available from several samples (see Table 2.2). Information exists on internal consistency (based on Cronbach's alpha) for the short form (3 WD-K), the parallel Forms A and B separate and together, and on the parallel test reliability of the Forms A and B. No retest study was undertaken (due to the nature of

TABLE 2.1
Means and Standard Deviations of the 3 WD Scales

	N	Sex	Age	INC-RES _f		NON _f		SEX _f		INC-RES _g		NON _g		SEX _g	
				M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Form A															
Hehl & Ruch (1985)	92	M, F	18-41	22.50	12.91	25.70	11.30	17.52	12.82	9.22	11.80	7.58	8.92	19.79	15.92
Jansa (1990)	102	M	19-35	21.44	11.60	26.19	9.32	21.17	11.87	3.93	5.66	5.77	6.98	10.28	10.97
Ruch & Hehl (1985)	120	M, F	18-37	21.50	12.90	23.32	12.14	14.81	11.55	5.15	7.84	7.39	9.02	17.38	14.41
Ruch & Hehl (1986a)	115	M, F	18-32	23.46	11.50	25.99	11.22	17.67	11.69	6.72	7.69	9.42	8.85	19.98	15.94
Ruch et al. (1984)	50	M	19-30	20.30	13.48	24.06	12.54	18.84	13.87	6.22	9.37	6.78	7.57	11.16	12.77
Form B															
Hehl & Ruch (1985)	92	M,F	18-41	23.41	12.15	26.33	11.56	18.38	13.51	8.78	11.47	9.34	9.15	20.04	16.43
Jansa (1990)	102	M	19-35	21.32	13.21	26.80	9.76	19.41	12.08	5.31	7.28	4.29	5.29	12.44	13.20
Ruch & Hehl (1985)	120	M, F	18-37	20.60	12.84	24.40	12.28	12.96	10.38	6.99	9.03	5.81	8.16	16.37	13.47
Ruch & Hehl (1985)	144	F	19-43	22.49	11.59	24.60	11.02	14.38	10.33	10.74	8.83	7.06	6.48	26.96	14.75
Ruch & Hehl (1986a)	115	M,F	18-32	23.15	12.15	27.01	11.91	17.38	11.23	8.76	9.84	7.57	8.15	21.16	15.68
Ruch et al. (1984)	50	M	19-30	22.92	12.45	23.74	11.33	19.88	12.55	8.56	8.12	7.68	9.25	16.78	13.69

Form K

Busse (1987)	68	M	20-31	31.21	16.77	36.91	17.68	26.50	15.84	9.60	14.14	10.37	11.85	22.50	21.23
Ciftci (1990)	260	M, F	18-58	47.67	18.04	36.04	15.32	43.57	18.02	28.38	20.55	35.27	20.92	36.05	22.16
Regul (1987)	160	M, F ¹	19-67	44.42	20.62	29.47	18.06	36.16	21.74	14.10	15.55	22.28	20.46	27.07	22.04
Ruch (1988)	160	M, F	18-55	43.43	17.46	34.22	17.63	29.08	16.54	8.46	11.49	15.05	15.89	24.56	21.01
Ruch & Hehl (1985)	159	M, F	20-69	37.16	19.04	32.56	16.78	27.77	17.73	11.18	13.72	15.75	15.76	29.68	22.08
Ruch & Hehl (1985)	51	M	19-30	31.00	17.29	39.48	17.07	28.20	16.89	9.60	11.38	11.64	11.31	27.84	22.18
unpublished data	86	M ²	36-56	47.66	18.13	27.79	16.22	38.94	17.30	6.98	11.96	16.33	18.92	17.79	16.74
unpublished data	137	M, F ³	20-85	48.97	18.66	28.39	17.25	34.71	20.18	8.25	11.46	17.86	20.05	28.08	23.04
unpublished data	110	M, F ⁴	19-45	47.50	17.58	32.45	15.92	31.90	18.07	8.18	11.10	17.31	15.00	33.57	23.06
Form A + B															
Jansa (1990)	102	M	19-35	42.91	23.86	53.07	17.96	40.75	22.84	9.19	12.03	10.02	11.57	22.72	23.73
Hehl & Ruch (1985)	92	M, F	18-41	54.91	22.53	52.02	20.41	35.90	24.03	18.00	21.54	16.91	15.84	39.83	30.22
Ruch & Hehl (1987)	115	M, F	18-32	46.60	22.43	53.00	21.46	35.05	21.67	15.47	16.57	16.99	15.52	41.15	30.68
unpublished data	121	M, F	15-28	42.48	24.33	37.17	20.17	39.79	24.31	16.93	19.15	23.93	23.67	32.88	24.73

¹psychiatric patients;

²"young" CHD-patients;

³psychosomatic patients;

⁴Austrian school teacher.

TABLE 2.2
Reliability Measures of the 3 WD

Sample	N	Sex	Age	INC-RES _f	NON _f	SEX _f	INC-RES _a	NON _a	SEX _a	rel
Form A										
Hehl & Ruch (1985)	92	M,F	18-41	.90	.81	.90	.91	.82	.91	IC
Jansa (1990)	102	M	19-35	.87	.69	.87	.79	.78	.91	IC
Ruch & Hehl (1985)	120	M,F	18-37	.90	.84	.87	.87	.83	.89	IC
Ruch & Hehl (1986a)	115	M,F	18-32	.83	.77	.84	.76	.76	.91	IC
Ruch et al. (1984)	50	M	19-30	.89	.85	.91	.90	.77	.93	IC
Form B										
Hehl & Ruch (1985)	92	M,F	18-41	.88	.81	.91	.90	.80	.93	IC
Jansa (1990)	102	M	19-35	.91	.73	.89	.82	.68	.91	IC
Ruch & Hehl (1985)	120	M,F	18-37	.90	.83	.87	.85	.82	.88	IC
Ruch & Hehl (1985)	144	F	19-43	.83	.77	.82	.70	.59	.86	IC
Ruch & Hehl (1986a)	115	M,F	18-32	.85	.79	.85	.82	.74	.90	IC
Ruch et al. (1984)	50	M	19-30	.84	.78	.88	.74	.82	.82	IC
Form K										
Busse (1987)	68	M	20-31	.89	.86	.88	.92	.86	.94	IC
Ciftci (1990)	260	M,F	18-58	.86	.79	.85	.90	.89	.90	IC
Joachim (1986)	73	M,F	19-35	.93	.72	.87	.88	.60	.92	IC
Rath (1983)	100	M,F	17-37	.71	.68	.65	—	—	—	IC
Regul (1987)	160	M,F	19-67	.90	.87	.91	.88	.91	.91	IC
Ruch & Hehl (1985)	159	M,F	20-69	.91	.86	.90	.88	.88	.91	IC
Ruch & Hehl (1985)	51	M	19-30	.91	.87	.90	.87	.82	.95	IC
unpublished data	137	M,F	20-85	.91	.88	.91	.88	.93	.93	IC
unpublished data	121	M,F	20-85	.90	.87	.92	.88	.93	.93	IC
unpublished data	86	M	36-56	.92	.88	.90	.92	.93	.90	IC
unpublished data	110	M,F	19-45	.90	.85	.90	.89	.86	.93	IC
Unterweger (1983)	104	M,F	19-30	.93	.90	.90	—	—	—	IC
Form A + B										
Jansa (1990)	102	M	19-35	.94	.84	.93	.88	.85	.95	IC
Hehl & Ruch (1985)	92	M,F	18-41	.93	.88	.94	.94	.88	.95	IC
Ruch & Hehl (1987)	115	M,F	18-32	.91	.87	.91	.88	.85	.95	IC
unpublished data	121	M,F	15-28	.91	.85	.91	.91	.91	.91	IC
Hehl & Ruch (1985)	92	M,F	18-41	.62	.60	.67	.71	.54	.74	PR
(4 weeks)										
Hehl & Ruch (1985)	96	M	18-32	.91	.86	.90	.90	.82	.93	PR
(no time lag)										
Jansa (1990)	102	M	19-35	.83	.74	.81	.71	.76	.89	PR
(2 hours)										
Ruch & Hehl (1985)	120	M,F	18-37	.90	.87	.86	.72	.86	.89	PR
(no time lag)										
Ruch et al. (1984)	50	M	19-30	.78	.83	.83	.63	.85	.76	PR
(2 weeks)										
Ruch & Hehl (1986a)	115	M,F	18-32	.80	.75	.79	.78	.67	.88	PR
(2 hours)										
Ruch et al. (1990)	4292	M,F	14-50	.69	.64	—	.74	.72	—	SHR
(1 month) ¹										

Note. rel = type of reliability. M = males. F = females. IC = internal consistency based on Cronbach's alpha. PR = Parallel test reliability. SHR = split half reliability.

¹abridged forms of the 3 WD pool.

the material), and only little is known about long-term stability of the scales.

Table 2.2 shows that, in general, the reliability estimates may be regarded as satisfactory for the scales of all forms of the 3 WD. The internal consistency varies between .68 and .95, mostly exceeding .80. There is also a sufficiently high degree of equivalence between Form A and B. The parallel test reliability of the six scales ranges between .67 and .93 (with a median of .86) when both forms are filled in on the same day. The samples with a time lag between 2 and 4 weeks yield coefficients between .54 and .85 with a median of .73. They seem to be lower, however. It cannot be determined whether the lower coefficients are due to the elapsed time span or to the fact that the latter set of data had unequal testing conditions (Form A was given in a small group pretesting, Form B after a lengthy experiment).

The split half reliability with a time lag of 1 month should also be regarded as conservative estimate of the stability of the 3 WD scales, because in this study only an abridged form with five items (of the 3 WD pool) was administered, and the testing conditions were not optimal (Ruch et al., 1990). More importantly, this study showed that internal consistency, parallel test reliability, and factor structure did not differ as a function of age of the subjects. Thus the 3 WD can be applied equally well to different samples across the adult life span.

Finally, Table 2.2 shows that, independent of the form of the humor test and the type of reliability estimation, there is a tendency for the nonsense category to obtain lower coefficients. This could be expected partly from the smaller variance of these scales as shown in Table 2.1.

Items Statistics. The distribution of the answers to single items usually shows that all seven steps of both funniness and aversiveness scales are used (i.e., any of the jokes and cartoons is considered extremely funny by at least one person but also extremely aversive by another). Nevertheless, the answer category "not at all aversive" (= 0) is the most frequent rating given for nearly all the items. Consequently, mean aversiveness of the items is low (e.g., in the sample studied by Ruch and Hehl, 1986b, the means range between .31 and 1.29 for INC-RES humor, between .19 and 2.70 for nonsense, and between 1.22 and 2.96 for the sexual humor category). Mean funniness is higher, the respective ranges being 1.48 and 3.06 (INC-RES), 1.38 and 4.11 (NON), and .72 and 3.55 (SEX).

Part-whole corrected item-scale correlations turn out to be satisfactorily high for all three forms. The median of the coefficients for the six scales (using all 90 items of Form A and B) in the aforementioned sample is .56 for INC-RES_f (range: .39 to .68), .50 for NON_f (.28 to .60), .61 for SEX_f (.23 to .72), .51 for INC-RES_a (.26 to .65), .48 for NON_a (.24 to .61), and .68 for SEX_a (.43 to .80). As a comparison, the medians for the respective scales

in the sample studied by Hehl and Ruch (1985) are .59, .45, .65, .65, .45, and .69. The results of the samples studied by Busse (1987) and Regul (1987) are used to demonstrate the item statistics of Form K; the medians of the part-whole corrected item-scale correlations are .57:.58, .52:.53, and .57:.61 for the funniness scales and .66:.53, .53:.60, and .70:.63 for aversiveness of incongruity-resolution, nonsense, and sexual humor, respectively. Thus, the relatively lower homogeneity of the nonsense scales is reflected in the item-scale correlations, too.

Finally, the number of items correlating higher with another humor category than with the own is low in all samples studied. On the average there is less than one such item in funniness of the three humor categories and in SEX_a. For aversiveness of the other two categories, there are roughly two such items out of the 15, respectively, 20 items of Form K (Busse, 1987; Regul, 1987) and Forms A plus B (Hehl & Ruch, 1985; Ruch & Hehl, 1986b).

Intercorrelation Between the Scales. Table 2.3 shows the intercorrelation between the 3 WD scales including the three subcategories of sexual humor based on the data presented by Ruch and Hehl (1987). These intercorrelations were obtained for both parallel forms combined in a sample of 115 nonpsychology students. Furthermore, data for the 3 WD-K is added based on a sample of 159 German adults studied by Ruch and Hehl (1985).

Table 2.3 shows that funniness of incongruity-resolution humor and nonsense humor tends to be positively correlated. Indeed a slight positive relationship between the two structural humor categories was found for

TABLE 2.3
Coefficients of Correlations between the 3 WD Scales

3 WD Scales	INC-RES _f	NON _f	SEX _f	INC-RES _a	NON _a	SEX _a
INC-RES _f	—	.38***	.63***	-.18*	.12	-.15
NON _f	.28**	—	.44***	.08	-.24**	-.04
SEX _f	.66***	.28**	—	-.02	.10	-.45***
INC-RES _a	-.26**	.09	-.24**	—	.57***	.50***
NON _a	.12	-.22*	-.05	.58***	—	.41***
SEX _a	-.02	.12	-.40***	.63***	.53***	—
<i>Types of sexual humor</i>						
PURE SEX _f	.63***	.28**	.96	-.26**	-.05	-.39***
INC-RES SEX _f	.68***	.10	.90	-.26**	.04	-.34***
NON SEX _f	.28**	.43***	.66	-.01	-.17	-.26**
PURE SEX _a	-.02	.14	-.39***	.64***	.49***	.97
INC-RES SEX _a	-.10	.13	-.41***	.62***	.44***	.92
NON SEX _a	.16	-.02	-.21*	.31**	.57***	.77

Note: Above the diagonal: Form K, $N = 156$. Below the diagonal: Form A + B, $N = 115$.
* $p < .05$; ** $p < .01$; *** $p < .001$.

nearly any sample studied (although mostly nonsignificant), although in the factor analytic studies an orthogonal solution seemed to provide the best fit.

Although it is assumed that enjoyment of sexual content and enjoyment of humor structure are *uncorrelated*, a positive correlation between SEX_f and funniness of the two structural humor categories is expected, due to the fact that subjects respond to the structural basis of sexual humor too. This is confirmed by Table 2.3. Furthermore, because most of the sexual humor in the present pool as well as in general is based on the incongruity-resolution structure, it is not surprising that SEX_f is correlated more highly with $INC-RES_f$ than with NON_f . Whereas the range of the correlations with nonsense humor across the different samples studied is between .19 and .45, the coefficients for incongruity-resolution humor vary between .46 and .80. The higher coefficients were obtained for male samples only. This is a noteworthy finding, because it shows that subjects tend to respond similarly to a "tendentious" humor category and to a category with no salient content.

The separation of the subgroups of sexual humor gives further support for the assumption of a structural basis in sexual humor. As already demonstrated by Ruch and Hehl (1986b), funniness of incongruity-resolution-based sexual humor ($INC-RES\ SEX_p$) correlates very highly with humor of other content when based on this structure ($INC-RES_f$; $r = .69, p < .001$), but not at all with humor based on the other structure (NON_f ; $r = .10$, NS). Similarly, nonsense-based sexual humor ($NON\ SEX_p$) correlates highly with nonsense humor of other contents (NON_f ; $r = .43, p < .001$), and the correlation with incongruity-resolution humor ($INC-RES_f$; $r = .28, p < .01$) does not exceed the values of the intercorrelation between the two structural categories. Thus the cross-structure correlations suggest that there is no relationship between funniness of the two structural factors and the sexual content. Furthermore, Table 2.3 shows that similar effects can be found for the aversiveness scores. The subgroups of sexual humor correlate more highly with the same than with the other structure category.

With respect to aversiveness, Table 2.3 shows generally positive intercorrelations between the three categories. This can be found in other samples too (median = .55). This higher intercorrelation might be expected from the fact that appreciation of different humor categories is superimposed by a more general tendency to find humor in general more aversive or not at all aversive (see Table 2.1).

Finally, Table 2.3 shows a negative intercorrelation between the funniness and aversiveness aspect in appreciation of humor. Across 15 samples considered, these coefficients range between .05 and $-.27$ for the incongruity-resolution and nonsense humor categories and between .01 and $-.46$ for sexual humor. The medians of $-.10$, $-.15$, and $-.30$ confirm that the aversiveness scales represent sources of variance that are not

covered by the funniness scales, and thus their use is justified. In general, the results support the separation of positive and negative responses to humor and the use of two rating scales in the 3 WD humor test.

FINDINGS OF PUBLISHED AND UNPUBLISHED STUDIES USING THE 3 WD

Several studies were conducted in order to validate the ingredients in appreciation of humor as proposed by the preceding model. Given the nature of the key elements in appreciation of humor as identified by factor analysis, any hypothesis set up has to bear in mind the differentiation between content and structure as well as between the funniness and the aversiveness component. The lack of consideration of these elements might be the main reason for the inconsistent findings relating humor appreciation to personality variables in prior research (see Hehl & Ruch, 1985, Nias, 1981, and Ruch & Hehl, 1986a, 1986b, for a review). For example, when studying sexual humor it was implicitly assumed that the whole reliable variance in funniness is due to the content, and structural properties do not contribute to funniness. Similarly, in other studies hypotheses assuming that some type of humor might be found *aversive* by certain subjects was tested with funniness scales only (i.e., a scale that does not cover negative responses).

Thus, the following review tries to reveal the different elements that are involved in the concepts assessed by the 3 WD scales. In detail, it evaluates whether there are individual differences in appreciation of humor per se (i.e., independent of the type of humor involved). It examines whether there exist general tendencies to find humor more or less funny, or more or less aversive. Furthermore, it reviews whether the nature of the two proposed types of structures involved in humor can be substantiated. Finally, the significance of the content in appreciation of sexual humor, isolated, and in context with structure is discussed. The evaluation of the contribution of structure and content to appreciation of humor covers both components involved, funniness and aversiveness.

Individual Differences in Degree of Appreciation

The nature of the model of humor under discussion does not suggest by itself the existence of general factors affecting the degree of appreciation irrespective of the humor category. The factor analytic results clearly contradict the assumption of a general factor in both, analysis of the stimuli material and of the response scales. There is, however, a consistent positive intercorrelation between appreciation of the three humor categories that is

low for funniness but relatively high for aversiveness (see Table 2.3). Thus, there is some room left for the assumption of stable individual differences in the tendencies to find humor generally more aversive or generally funnier. Because the differences between the categories were more obvious than their possible similarities, no study was conducted testing such hypotheses.

Recent developments in emotion research, however, reintroduces this question. There is increasing evidence that separate factors of *positive affect* and *negative affect* can be extracted from different materials (see Diener & Emmons, 1984; Watson & Tellegen, 1985). Like funniness and aversiveness, these factors are orthogonal. Moreover, extraversion predicts individual differences in positive affect and neuroticism accounts for individual differences in negative affect. Thus, the question arises whether these relationships can be found in the realm of humor appreciation as well. Because funniness represents the positive responses to humor and aversiveness covers the possible negative ones, it could be hypothesized that extraversion correlates positively with funniness of the three humor categories and neuroticism predicts their aversiveness.

Generalized Individual Differences in Funniness?

The data allowing the evaluation of a possible relationship between extraversion and the disposition of finding all types of humor funnier come from studies testing the Eysenckian/Cattellian hypothesis that extraverts prefer sexual humor relative to introverts. Whereas this hypothesis received some support from studies using the 3 WD and other humor tests, the majority of the studies does not show significant relationships (Hehl & Ruch, 1985; Joachim, 1986; Regul, 1987; Ruch & Hehl, 1985). Two peculiarities prevent the abolition of extraversion in the field of humor appreciation. First, in the seven samples using the 3 WD, two yielded a significantly positive correlation between SEX_f and extraversion, and none yielded a negative correlation. Second, all the coefficients for the other two humor categories were positive as well. Thus, although only three correlations exceeded the individual level of significance, all the 21 coefficients were positive. Similar patterns were found in studies of the primary factors of extraversion as contained in several multidimensional personality inventories. The scales of surgency, venturesomeness, need for affiliation and play, sociability, composedness, and energy level yielded generally positive coefficients and thus also support the hypothesis (Hehl & Ruch, 1985; Joachim, 1986).

Thus, the hypothesis that extraverts respond to humor generally more positively than introverts cannot be rejected completely on grounds of the

existing data; however, the zero-order coefficients obtained generally lack both statistical and practical significance.

Generalized Individual Differences in Aversiveness?

The data collected also allow evaluation of the hypothesis that neuroticism is a predictor of negative responses to humor. Although only 5 of the 21 correlations between the neuroticism scales of the EPQ or EPI and aversiveness of the humor categories are significant, all except 2 are positive. Similarly, variables associated with N were predictive too, like trait-anxiety (measured via three different scales; i.e., STAI, STPI, and JPI), depressivity, nervousness, guilt proneness, or low ego strength (Hehl & Ruch, 1985; Joachim, 1986). Anxiety and depressiveness scales yield higher coefficients than neuroticism, and extraversion also tends to be negatively correlated with aversiveness. Therefore, the hypothesis could be refined by stating that *introverted* neurotic (i.e., anxious, depressive) individuals tend to respond to humor more negatively in general. Support for the involvement of negative affectivity in generally negative responses to humor comes from a study of sexual attitudes (Ruch & Hehl, 1988); subjects high in sexual prudishness and low in sexual satisfaction found humor of all categories aversive (see also Hehl & Ruch, 1990).

There is a second cluster of variables involved in the general rejection of humor. Whereas the preceding variables share an element of negative affectivity, the second cluster relates to tendermindedness. Humor of all categories is found more aversive by tender than by tough subjects. This could be demonstrated for factors of tendermindedness extracted from personality scales (Ruch & Hehl, 1986b), as well as attitude inventories (Ruch, 1984; Ruch & Hehl, 1986b). Results falling in line with the tendermindedness hypothesis relate to the finding that intraceptive (social, religious, and aesthetic) values go along with high aversiveness, and extraceptive (political, economical, and theoretical) values go along with low aversiveness (Ruch & Hehl, 1987; Study I). Similarly, high interest in technical matters is also a predictor of low aversiveness of humor (Hehl & Ruch, 1990). Furthermore, using the Rokeach Value Survey (Rokeach, 1982), it was found that, whenever an instrumental value was significantly correlated with aversiveness, moral or interpersonal values correlated positively and competence or self-actualization values correlated negatively with aversiveness of humor of all three factors (Ruch & Hehl, 1987; Study II). Finally, the disinhibition subscale of the sensation-seeking scale (Zuckerman, 1979), which is located on the toughmindedness axis, also predicts low aversiveness of humor in four samples (Ruch, 1988).

It was argued that the two groups of predictors might relate to different aspects of aversiveness (Ruch & Hehl, 1988). The tendermindedness com-

plex might refer to the easiness with which feelings are hurt or subjects feel offended by humor, whereas the neuroticism complex determines the threshold for a negatively toned response and its intensity.

Thus, whereas there are only spurious effects of extraversion on generalized positive responses to humor, marked effects can be found for aversiveness. Tenderminded neurotics tend to find humor aversive throughout.

Appreciation of Humor Structure

Much more effort was spent in verifying the existence of the two structures involved in humor. It is assumed that, in jokes and cartoons of the two structure-dominated humor categories (INC-RES and NON), the content plays a minor role. This is inferred from the heterogeneity of the themes involved. These factors of humor emerged because of individual differences in the subjects' responses to the different structural properties of these jokes and cartoons.

Evidence from several sources led to the hypotheses that appreciation of the incongruity-resolution structure is a manifestation of a broader need of individuals for contact with structured, stable, unambiguous forms of stimulation, whereas appreciation of the nonsense structure in humor reflects a generalized need for uncertain, unpredictable, and ambiguous stimuli. First, interpretation of the factors suggests that the two structures mainly differ with respect to the degree of resolution obtained. In incongruity-resolution humor a complete resolution of the incongruity is possible, although there are residual traces of incongruity in nonsense humor. Thus, in the first category the resolution of incongruity contributes to appreciation, whereas in Factor 2 appreciation is based on the existence of residual incongruity. Second, correlations between the 3 WD humor scales and a self-report measure of humor (Ruch, 1980) reveal that self-reported preference for complex and unconventional forms of humor go along with appreciation of nonsense humor (high funniness and low aversiveness) and with low funniness of INC-RES humor (Ruch & Hehl, 1985). Third, studies analyzing perceived attributes of humor of the three categories come to the conclusion that nonsense is associated with a higher stimulative value than the incongruity-resolution structure (Joachim, 1986; Rath, 1983; Ruch et al., 1988; Schmiedel, 1987). This could be shown for the attributes original, subtle, and puzzling (Ruch et al., 1988), unprobable (Schmiedel, 1987), and perceived difficulty to understand (Joachim, 1986; Schmiedel, 1987). Furthermore, ratings of funniness and being puzzled are significantly positively correlated within nonsense humor but not within incongruity-resolution humor (Rath, 1983). Within-subjects analysis suggests that rank orders of funniness and experienced surprise are correlated in both forms of

humor structures; the average size of the correlation is significantly higher for subjects preferring nonsense humor. Furthermore, factor analysis of response scales reveals that the puzzlement rating loads only on the funniness factor (.96) when nonsense humor is analyzed but loads higher on the negative response factor (.63) than on the funniness factor (.51) when incongruity-resolution humor is analyzed (Ruch et al., 1988). Finally, subjects preferring incongruity-resolution humor tend to rank those jokes and cartoons low in funniness that they also consider highly unpredictable and hard to comprehend, whereas this correlation has the reversed sign for subjects preferring nonsense humor (Schmiedel, 1987).

These differences between the two structures as well as hypotheses formulated elsewhere (e.g., Ruch, 1988; Ruch & Hehl, 1985) suggested that certain personality variables are promising predictors of humor that have not been considered previously. The higher degree of stimulation (e.g., unpredictability, unresolved incongruity, complexity, perceived surprisingness, and perplexingness) associated with nonsense humor should lead to higher aversiveness scores by subjects with a general dislike and avoidance of stimulus uncertainty (in information theory sense; e.g., complexity, novelty, ambiguity, incongruity, unfamiliarity, unpredictability). Whereas *tolerance* of high stimulus uncertainty is a necessary prerequisite for low aversiveness of nonsense, it is questionable whether *mere* tolerance is sufficient for deriving pleasure from it. Therefore, it was argued that high funniness of nonsense humor requires an active pursuit of high levels of stimulation (Ruch, 1988; Ruch & Hehl, 1983a). Conversely, the lower degree of stimulation (e.g., completely resolvable incongruities, lower degrees of unpredictability and complexity) associated with incongruity-resolution humor should appeal to those who generally avoid high levels of stimulation and seek out simpler and safer forms of stimulation. Whereas this allows for the predictions of funniness of INC-RES humor, it is questionable whether the characteristics of this structure can produce high levels of aversiveness (as confirmed by low means in Table 2.1). Jokes and cartoons of this structure can be considered to be below the optimal level of cognitive challenge (see McGhee, 1979), resulting in judgments of being boring, which is halfway between low funniness and aversiveness (Ruch et al., 1988).

Intolerance of ambiguity, conservatism, and sensation seeking were the personality variables considered to provide the clearest conceptual links to appreciation of structural properties in humor, and thus their ability to predict interindividual differences in appreciation of humor structure was investigated in several correlational and experimental studies. The existing data regarding these variables is reviewed next.

Besides mere preference for different degrees of stimulation, it has to be considered that comprehension of the punchline is a prerequisite for

appreciation of humor. Because of the fact that this element is also involved, the effects of intelligence are briefly considered too.

Conservatism and Appreciation of Humor Structure

Studies investigating the structure of social attitudes usually extract two bipolar factors of conservatism–radicalism (C) and of tough–tendermindedness (T) (Eysenck, 1954; or conservatism–liberalism and realism–idealism in the terminology of Wilson, 1973). Sometimes a third factor of economic capitalism–socialism is added (Eysenck, 1976). The conservatism factor accounts for most of the variance and was considered to be suited for predicting individual differences in humor because there exists a clear conceptual link between the two basic types of humor structure (Ruch, 1984). According to Wilson's (1973) dynamic theory of conservatism, this trait reflects a *generalized fear of both stimulus and response uncertainty*. This should lead more conservative individuals to show greater avoidance and dislike of novel, complex, unfamiliar, incongruous events and to prefer and seek out stimuli that are simpler, more familiar, and congruent. This model of conservatism received support by successfully predicting preference for structural properties involved in different forms of art (Wilson, 1973), poetry (Gillies & Campbell, 1985), and music (Glasgow, Cartier, & Wilson, 1985).

The relationship between conservatism and the 3 WD humor scales were studied over the last decade. The hypotheses tested in the first studies (Ruch, 1981, 1984) validated that conservative persons find incongruity–resolution humor funnier and nonsense humor more aversive than liberals. Although the basic hypotheses remained stable, the model specifying this relationship was formulated more precisely. One major step was the consideration of the T-factor, which helped to resolve the inconsistencies in the new findings (e.g., Ruch & Hehl, 1986a). The new structural model allowed for the discussion of appreciation of *content* and *structure* of (at least) incongruity–resolution-based humor within a space with two dimensions only (Ruch & Hehl, 1986b). According to this model, conservatism is a predictor of funniness of incongruity–resolution-based humor irrespective of the content, whereas toughmindedness is a predictor of appreciation of sexual content in humor, irrespective of the structural basis of the joke or cartoon. Hence, INC–RES SEX_f is located in the toughminded conservative quadrant (see Fig. 2.1). Because NON_f is only negligibly negatively correlated with conservatism, the location of NON SEX_f is on the T-axis. As discussed earlier, aversiveness of the three humor categories is located on the tenderminded side of this axis. Additionally, according to their structural properties, aversiveness of nonsense-based humor is located on the conservative and aversiveness of incongruity–resolution-based humor is located on the radical side of the C-axis. Thus, whereas nonsense humor

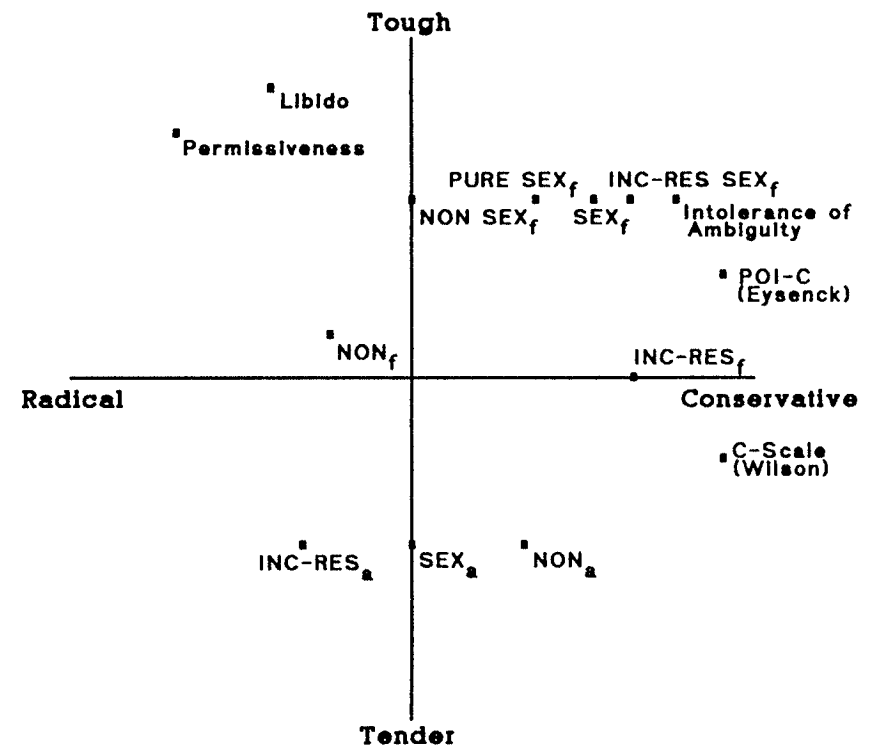


FIG. 2.1 Probable placement of various concepts and the 3 WD humor scales in relation to conservatism and toughmindedness.

should be found aversive by tenderminded conservatives, incongruity–resolution humor should be found aversive by tenderminded radicals.

This location explains the initially perplexing results for different conservatism scales and for several variables associated with conservatism (e.g., superego strength, rigidity, or intolerance of ambiguity). Knowing whether these variables are biased toward tender or toughmindedness allows for the prediction of subtle differences in the profile of correlations with the humor scales. Thus, as compared with pure conservatism measures, scales with a toughmindedness bias will correlate more highly with SEX_f than with INC–RES_f and also more highly negatively with INC–RES_a, which is located in the opposite (i.e., tenderminded radical) quadrant (see Fig. 2.1). Scales with a tendermindedness bias will not correlate with SEX_f or at least lower than with INC–RES_f, but they will correlate more highly with NON_a, which is located in the same (i.e., tenderminded conservative) quadrant.

Table 2.4 shows the correlation coefficients between different measures of conservatism and the 3 WD humor scales for different samples.

TABLE 2.4

Coefficients of Correlation between Conservatism and Appreciation of Humor

Studies	Sample		Measures			Humor Appreciation					
	m	f	Cons.	3 WD		INC-RES _f	NON _f	SEX _f	INC-RES _a	NON _a	SEX _a
Austrian/German samples											
Busse (1987)	68	— S	WP	K		.30*	-.13	.11	-.03	.19	.16
Hehl & Ruch (1985)	49	56 S	16PF	A + B		.17	-.02	.05	.15	.32**	.27**
Jansa (1990)	100	— S	WP	A + B		.39***	.08	.34***	-.01	.34***	.27**
Joachim (1986)	39	34 S	WP	K		.37***	-.17	.12	-.15	.12	.17
Rath (1983)	50	50 S	WP	A + B ^a		.42***	-.02	.02	—	—	—
Regul (1987)	81	79 P	WP	K		.27**	-.06	.12	.24**	.33***	.17*
Ruch (1984)	55	55 A	WP	A + B ^a		.48***	-.15	-.12	-.09	.33***	.35***
	134	— S	WP	A + B ^a		.46***	-.27**	.28**	-.20*	.19*	-.01
Ruch & Hehl (1985)	—	144 S	WP	B		.39***	.04	.05	-.25**	.03	.06
	44	48 S	WP	A + B		.26*	.00	.20*	.03	.25**	.18
Ruch & Hehl (1986a)	59	56 S	WP	A		.32***	-.21*	.19*	-.06	.22*	.02
			WP	B		.40***	-.12	.25**	-.17	.10	.09
			POI	A		.28**	-.17	.44***	-.10	.10	-.20*
			POI	B		.33***	-.07	.47***	-.23*	.13	-.18*
			MK	A		.24**	-.24*	.28**	-.13	.02	-.21*
			MK	B		.31**	-.13	.29**	-.28**	.15	-.15
			16PF	A		.19*	-.16	.18*	.06	.33***	.13
			16PF	B		.24*	-.13	.27**	.04	.34***	.19*
Ruch & Hehl (1986b)	59	56 S	C'	A + B		.41***	-.17	.39***	-.19*	.20*	-.05
			C''	A + B		.46***	-.18	.42***	-.25**	.13	-.15
French sample											
Accoce (1986)	69	70 S	POI'	A + B ^a		.32***	-.13	.04	—	—	—
			POI ²			-.04	-.22*	.26**	—	—	—
Turkish sample											
Ciftci (1990)	125	135 A	WP	K		.19**	.09	.05	.06	.13*	.15*

Note: m = male, f = female. POI = Public Opinion Inventory (Eysenck, 1976). 16PF = inverted radicalism scale of the 16PF. WP = C-Scale (Wilson and Patterson, 1970). MK = Machiavellianism-conservatism scale (Cloetta, 1983).

C' and C'' = Conservatism factors extracted at scale or item levels.

¹Humor tests using the 3 WD item pool. ²Law and Order factor; ³Right-wing Extremism factor derived from the POI.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Conservatism and Funniness of Incongruity-Resolution Humor. Table 2.4 shows the robustness of the relationship between INC-RES_f and conservatism. This main finding was obtained in samples from four different nations (Austria, France, Germany, and Turkey), for both sexes, for students as well as adults, and for normals and psychiatric patients. Furthermore, it was also found for all three forms of the humor test and for four types of conservatism scales. It is likely that the coefficients for French and Turkish samples would be higher, if conservatism scales were used that are standardized for the respective country.

Further support for the hypothesis comes from a study on disparagement humor that was based on a completely different pool of incongruity-resolution jokes and cartoons (Korioth, 1985). Items were selected by judges to be representative for 15 categories. Each category consisted of pairs of "opponents" involved (e.g., husband-wife, teacher-pupil, doctor-patient) with one disparaging the other. For example, there was a category of a teacher disparaging a pupil and another in which the pupil was superior. Factor analysis further helped to subdivide these categories. Finally, a sample of 100 students rated these jokes and cartoons for funniness. Conservatism correlated with *each* of the final 26 categories significantly positive; the coefficients ranged between .31 to .48, with a median of .40. Thus, independently who is disparaging whom in jokes and cartoons, conservative subjects show more appreciation than liberal subjects if humor is based on the incongruity-resolution structure.

The correlation could also be found for an abridged form of the humor test and a conservatism index based on four attitude scales (Ruch et al., 1990). In a sample of 4,292 German subjects between the ages of 14 and 50 (with 37 over age 50), the correlation coefficient was .214, $p < .001$.

Further support comes from the fact that the relationship between conservatism and INC-RES_f could be found at the level of individual jokes and cartoons. In the two samples of the first study, 21 of 48, respectively, 74 of the 120 jokes and cartoons yielded significant ($p < .05$) coefficients (Ruch, 1984). In both samples all items with significantly positive coefficients were based on the INC-RES structure (including sexual humor). In the study by Ruch and Hehl (1986b), all 20 INC-RES jokes and cartoons correlated positively, and 16 of them were significant ($p < .05$; two-tailed). Furthermore, a higher order relationship¹ was verified for these three samples. The higher a joke or cartoon was correlated with conservatism, the higher was its loading on the INC-RES factor. Phi coefficients were computed to determine the strength of the similarity of the two profiles and they turned out to be very high: .90, .91, .95, and .96. Jokes that are more strongly associated with conservatism are also more typical for the first factor. Single conservatism items, on the other hand, correlated with INC-RES_f, and the size of these correlations increased with the size of the

part-whole corrected item total correlations, again resulting in a high Phi coefficient, .94 (Ruch & Hehl, 1983b).

Further support for the hypothesis comes from studies with personality variables (Hehl & Ruch, 1985; Joachim, 1986; Ruch, 1988; Ruch & Hehl, 1983a, 1985, 1986a, 1986b), values (Ruch & Hehl, 1987), and social (Ruch & Hehl, 1985), sexual (Ruch & Hehl, 1988), and health-related attitudes (Hehl & Ruch, 1990). In these studies, only those variables that correlated with INC-RES_f were also either markers of conservatism or highly correlated with it. There were positive correlations with scales of superego strength, shrewdness, self-sentiment, rigidity, stinginess with money, need for achievement, or value orthodoxy and negative correlations with scales measuring aesthetical interests, complexity, sexual permissiveness, education to autonomy, or bohemian unconcernedness. Among these variables, inhibition of aggression deserves special mention, because computation of partial correlations revealed that conservatism could not fully account for the observed correlations between inhibition of aggression and INC-RES_f in two samples (Ruch & Hehl, 1985). This finding suggests that inhibition of aggression adds to the prediction of INC-RES_f.

An independent source of support for this hypothesis was provided by the aforementioned cross-sectional study (Ruch et al., 1990). Trend analyses revealed that age-related differences in conservatism across the sample accounted for 90.5% of the age-related variance in INC-RES_f. More importantly, the residual was not significant once the effects of conservatism were partialled out.

Conservatism and Funniness of the Structural Basis in Sexual Humor.

Table 2.4 confirms that conservatism is also a predictor of the *structural basis* of sexual humor. Using a pure measure of conservatism, coefficients around .40 can be obtained. The coefficients are even higher (.44, .47) for INC-RES SEX_f and zero (.02, .05) for NON SEX_f (Ruch & Hehl, 1986b). Consistent with the assumption that conservatism and appreciation of sexual *content* are largely uncorrelated, low or even negative coefficients were obtained when conservatism was related to the *factor* of sexual humor (which consists of content variance only; Accoce, 1986; Ruch, 1984). The finding that the conservatism scale by Wilson and Patterson (1970) is biased toward tendermindedness (due to the idealism items scored for conservatism) additionally accounts for the low size of the coefficients obtained. Whereas this scale is located in the *tenderminded* conservative quadrant, SEX_f is located in the *toughminded* conservative quadrant. Thus, in order to verify the hypothesis that conservatism is a predictor for the structural basis of sexual humor, future studies have to carefully exclude the idealism items from the scale.

Further support for effects of conservatism on the structural basis of

sexual humor can be found at the level of individual jokes and cartoons. For incongruity-resolution-based sexual jokes and cartoons, 15 of 17 correlate significantly positively with conservatism (Ruch & Hehl, 1986b). Furthermore, the higher a sexual joke correlates with conservatism, the higher its second loading on the first factor (Phi = .93., .94).

Conservatism and Funniness of Nonsense Humor. Table 2.4 suggests a slight negative correlation between conservatism and NON_f, the coefficients typically ranging between $-.15$ to $-.20$, but they are seldom significant. This finding agrees with the expectations that liberals tend to tolerate unresolved incongruities more than conservatives. However, mere tolerance is not sufficient for finding nonsense funny.

Conservatism and Aversiveness of Humor Structure. Table 2.4 reveals that correlation coefficients between conservatism and INC-RES_a are overwhelmingly negative and are significant in the study with the most comprehensive assessment of conservatism (Ruch & Hehl, 1986b). The low size of the coefficients is in accordance with the fact that this scale has the lowest mean and the smallest variance of all 3 WD scales (see Table 2.1). Apart from this, it has to be considered that the orthogonal elements of tendermindedness and neuroticism are involved in general aversiveness, too. Whereas the results suggest that conservatives tend to find incongruity-resolution less aversive than radicals, this effect is small. Thus, replication studies ideally should combine the predictive power of conservatism, neuroticism, and tendermindedness.

At first glance, Table 2.4 clearly seems to support the hypothesis that conservatism predicts aversiveness of nonsense, because all the coefficients are positive and significant in more than half the samples. Nevertheless, the results obtained for the Wilson and Patterson scale might be biased due to its location in the tenderminded conservatism quadrant. Indeed, the factor analytically derived C-axes yield lower coefficients, one being significant, the other not (Ruch & Hehl, 1986b). However, there are two facts contradicting the idea that the results only reflect tendermindedness variance. First, the inverted radicalism scale of the 16 PF correlates significantly positively with NON_a in two samples. Second, the conservatism scales with a toughmindedness bias also correlate *positively* albeit not significantly so. Thus, the results favor the interpretation that conservatives tend to find nonsense humor aversive, although the effect might be lower than suggested by the Wilson and Patterson scale.

With respect to aversiveness of sexual humor, Table 2.4 reveals positive, negative, and nonsignificant coefficients. Assuming that conservatism is unrelated to appreciation of sexual *content* in humor and the dislike of the nonsense structure outweighs the like of the incongruity-resolution struc-

ture, one would predict a zero correlation between conservatism and SEX_a. This finding emerged precisely for the conservatism factor (Ruch & Hehl, 1986b). Negative correlations were obtained for the scales biased toward toughmindedness (e.g., Eysenck's POI), whereas positive coefficients seemed to be a function of a tendermindedness bias of the scale (e.g., in the Wilson-Patterson C-scale). Thus, the assumption of no relationship between conservatism and SEX_a still seems valid.

Intolerance of Ambiguity and Appreciation of Humor Structure

Intolerance of ambiguity, introduced by Else Frenkel-Brunswik (1949) as an emotional and perceptual personality variable, overlaps with conservatism both theoretically and empirically. Accordingly, similar hypotheses regarding appreciation of humor were derived, and the first study confirmed the predictions that intolerant individuals give both higher funniness ratings to incongruity-resolution-based humor and higher aversiveness ratings to nonsense humor than do subjects who are more tolerant of ambiguity (Ruch & Hehl, 1983a). Inspection of the correlations between the scale and funniness of each of the 120 jokes and cartoons revealed that, in nearly one half of cases (57 jokes and cartoons), the coefficients were significant. Table 2.5 presents the results of the various replication samples.

It can be seen from Table 2.5 that the correlation coefficients obtained generally support the hypotheses albeit not being significant in each case. Nevertheless, the interest in this variable ceased out of two reasons. First, the German version of the intolerance of ambiguity scale was discovered to have low internal consistency. Second, intolerance of ambiguity correlated positively with conservatism *and* with toughmindedness, which lowered its usefulness as a predictor of humor *structure*. Its location in the toughmindedness-conservatism quadrant explains two anomalies of Table 2.5 not foreseen by the hypotheses. The additional toughness element involved in intolerance of ambiguity is responsible for the generally higher coefficients for SEX_f than for INC-RES_f, because it also contributes to the explanation of content variance, which is orthogonal to structure variance. Furthermore, the toughness element is also responsible for the inconsistent results for NON_a, which are lower than expected. Whereas both aversiveness of nonsense and intolerance of ambiguity are correlated with conservatism, the former is located on the tender side of the T-axis whereas the latter is on the tough side and thus suppressed the effects.

Nevertheless, despite its loss as a pure predictor of humor structure, intolerance of ambiguity remains a potent predictor of funniness of sexual humor based on the incongruity-resolution structure.

TABLE 2.5
Coefficients of Correlation between Intolerance of Ambiguity and Appreciation of Humor

Studies	Sample		Measures			Humor Appreciation				
	m	f	INT.A.	3 WD		INC-RES _f	NON _f	SEX _f	INC-RES _a	NON _a SEX _a
<i>German samples</i>										
Busse (1987)	68	—	BB	K		.02	-.19	.12	.02	.08
	68	—	KI	K		.14	-.13	.15	.00	.13
Jansa (1990)	100	—	BB	A + B		.23*	-.09	.26**	.02	.24*
Ruch & Hehl (1983a)	134	—	BB	A + B ^a		.19*	-.03	.34***	-.06	.19*
Ruch & Hehl (1985)	—	144	BB	B		.26**	.13	.24**	-.11	.01
	44	48	BB	A + B		.15	.15	.39***	.20	.28**
Ruch & Hehl (1986a)	—	56	BB	A		.17*	-.06	.37***	.07	.15*
	—	59	BB	B		.26**	.02	.40***	-.03	.17*
	—	—	BB	A + B		.23*	-.02	.40***	.01	.18
<i>French sample</i>										
Accoce (1986)	69	70	BB ¹	A + B ^a		.23**	.03	.10	—	—
	—	—	BB ²	A + B ^a		.26**	-.25**	.19*	—	—

Note: m = male, f = female. BB = Intolerance of Ambiguity (Brenkelmann & Brenkelmann, 1960).

KI = Intolerance of Ambiguity (Kischkel, 1984).

¹Uncertainty Avoidance factor;

²Authoritarianism factor derived from the BB.

^aHumor tests using the 3 WD item pool.

*p < .05. **p < .01. ***p < .001.

Sensation Seeking and Appreciation of Humor Structure

Zuckerman (1979) defines *sensation seeking* (SS) as "a trait defined by the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences" (p. 10). Thus, whereas intolerance of ambiguity and conservatism emphasize the uncertainty-avoiding aspect and thus only allow for the prediction of *tolerance* (i.e., low aversiveness) of nonsense humor, SS also was expected to be involved in *funniness* of nonsense humor.

Ruch (1988) hypothesized that *Experience Seeking* (ES) and *Boredom Susceptibility* (BS) will be related to appreciation of structural properties in humor. ES involves the seeking of stimulation through the mind and the senses, through art, travel, even psychedelic drugs, music, and the wish to live in an unconventional style. There is evidence that ES is closely related to the *novelty* and *complexity* dimension of stimuli (Zuckerman, 1984). BS represents the tendency to avoid repetitive experience and was considered to be sensitive to the differences between incongruity-resolution humor and nonsense humor. Furthermore, ES and BS turned out to be the subscales of sensation seeking most highly correlated with structural properties of different aesthetic objects such as art (Furnham & Bunyan, 1988; Zuckerman, 1979) or music (Glasgow et al., 1985; Litle & Zuckerman, 1986).

Seven hypotheses relating SS to funniness and aversiveness of humor content and structure were derived and tested (Ruch, 1988). The hypotheses relating to the structure of humor predicted that ES and BS, as well as the total score of the sensation-seeking scale, will correlate positively with NON_f , negatively with $INC-RES_f$, and negatively with NON_a . The results of a 448-subject sample are presented in Table 2.6.

Table 2.6 reveals that sensation seeking is an important ingredient in appreciation of humor structure. Like individuals high in conservatism and intolerance of ambiguity, the low sensation seeker dislikes nonsense humor and judges it aversive but gives high funniness ratings to incongruity-resolution humor. Sensation seeking, however, also predicts funniness of

TABLE 2.6
Coefficients of Correlation Between Sensation Seeking and Appreciation of Humor

	$INC-RES_f$	NON_f	SEX_f	$INC-RES_a$	NON_a	SEX_a
Thrill and Adventure Seeking	.02	.09	.11*	-.09	-.13**	-.17***
Experience Seeking	-.24***	.20***	-.03	.01	-.22***	-.15**
Disinhibition	-.18***	.07	.20***	-.11*	-.20***	-.36***
Boredom Susceptibility	-.23***	.15**	-.02	.01	-.22***	-.15**
Total SS	-.20***	.17***	.08	-.06	-.25***	-.28***

* $p < .05$. ** $p < .01$. *** $p < .001$.

nonsense humor. The coefficients of correlations are low but reliable, because they are based on a large sample size.

Analyses of the results of subsamples showed that, whereas all the signs were in the expected direction, the correlation coefficients were not significant throughout. Similar inconsistency was found in two recent replication studies. In a sample of 260 Turkish male and female adults, both funniness and aversiveness of nonsense were significantly predicted by ES ($r = .26, p < .001$; $r = -.25, p < .001$), BS ($r = .24, p < .001$; $r = -.24, p < .001$), and the total scale ($r = .22, p < .001$; $r = -.20, p < .01$). However, there was a failure to replicate the results for incongruity-resolution humor (Ciftci, 1990). There was an opposite pattern of results for a sample of 100 male German students. Incongruity-resolution humor was considered funny by subjects low in ES ($r = -.32, p < .001$), BS ($r = -.42, p < .001$), and the total scale scores ($r = -.37, p < .001$). The hypothesis relating to NON_a , however, received only slight support (coefficients of $-.18, -.12$, and $-.25$). Furthermore, there was no support at all for the hypothesis relating to funniness of nonsense. This failure is partly explainable by the extraordinarily low variance in the respective humor scales obtained for these samples (see Table 2.1).

This inconsistency led to the hypothesis that sensation seeking (mainly ES and BS) determines the preference for nonsense humor over incongruity-resolution-based humor independent of the degree of enjoyment induced by these two categories (Ruch, 1988). This hypothesis was tested by correlating a Structure Preference Index (SPI; obtained by subtracting $INC-RES_f$ from NON_f) with the sensation-seeking scales (see Table 2.7).

Table 2.7 shows that the SPI score correlates positively with ES, BS, and the total scale in all samples, suggesting that sensation seekers consider humor based on the nonsense structure funnier than incongruity-resolution

TABLE 2.7
Coefficients of Correlation Between Sensation Seeking and Structure Preference

	TAS	ES	DIS	BS	TOTAL
<i>Ruch (1988)</i>					
sample 1	-.19*	.27**	.15	.33***	.18
sample 2	.10	.50***	.23	.37**	.38**
sample 3	.12	.31***	.15	.26**	.29***
sample 4	.09	.30**	.32**	.31**	.33***
sample 1-4	.06	.40***	.23***	.35***	.34***
<i>Replications</i>					
Jansa (1990)	.06	.31**	.18	.45***	.34***
Ciftci (1990)	-.11	.20**	.24***	.12	.13*

Note: TAS = Thrill and Adventure Seeking. ES = Experience Seeking. DIS = Disinhibition. BS = Boredom Susceptibility. Total = Total Sensation Seeking.

* $p < .05$. ** $p < .01$. *** $p < .001$.

humor, independent of the absolute degree of appreciation for these two types of humor. This finding is much more stable than the correlations with the funniness scales. Furthermore, the results were obtained in the replication samples too (Ciftci, 1990; Jansa, 1990), suggesting that this finding is valid for Austrian (Ruch, 1988; Sample 3), German, and Turkish (Ciftci, 1990) samples, for students and adults. The preference for nonsense structure could also be extracted from the aversiveness scores. However, the coefficients are lower but still significant (Ruch, 1988).

Further support for a relationship between nonsense and SS comes from the results of variables closely related to sensation seeking, for example, venturesomeness (Hehl & Ruch, 1985) or hedonism (Hehl & Ruch, 1990), as well as from trends in cross-sectional age differences in nonsense and sensation seeking (Ruch et al., 1990).

Seeking-Avoiding Stimulus Uncertainty and Appreciation of Humor Structure

A more direct verification of the nature of the structure elements in humor was undertaken by investigating preference for stimulus properties like symmetry-asymmetry or complexity-simplicity in objects different from humor (Busse, 1987; Ruch, 1986). The experimental tasks covered subjects' exploratory behavior when wearing "prism glasses," judging art postcards placed into four categories (simple-nonfantastic, simple-fantastic, complex-nonfantastic, and complex-fantastic), judging polygons of different complexity, making preference selection of polygons based on symmetry, and producing aesthetically pleasing and displeasing black-white patterns on a square card containing 10 rows and 10 columns.

These studies give strong support for the structural basis of nonsense humor; NON_f correlated positively with the following variables: liking of the "complex-nonfantastic" and "complex-fantastic" art postcards, peer-rated complexity of the "pleasing" pattern, duration of time wearing the prism glasses, and the number of actions designed to increase novel or incongruous visual feedback. On the other hand, $INC-RES_f$ correlated positively with liking of the "simple-nonfantastic" art postcards, whereas the positive correlation with the category "simple-fantastic" just failed to reach significance. The structure preference score was significantly correlated with preference for asymmetrical polygons: Subjects tending to prefer nonsense humor also more frequently found the asymmetrical alternative polygons more pleasing.

These studies provide stronger tests of the hypothesis that the enjoyment of different forms of humor reflect broader dispositions to seek out and enjoy events that offer more or less stimulus uncertainty, because there is little method overlap. Also such experimental tasks better incorporate the

postulated structural properties than do questionnaire assessment of the respective personality traits. Thus, further studies along these lines are recommended.

Intelligence and Appreciation of Humor Structure

The differences between incongruity-resolution and nonsense structure with respect to both difficulty and complexity levels would suggest that general intelligence is a relevant variable in appreciation of humor. The assumption of the importance of a match between level of a person's ability and degree of stimulus challenge as a prerequisite for maximal humor appreciation (as stated by the "optimal level of cognitive challenge" model, see McGhee, 1979) would suggest a positive correlation with NON_f and negative correlations with $INC-RES_f$ and NON_a . Emphasizing the fact that understanding is a prerequisite for appreciation would lead to the same predictions.

The relationship between intelligence and the 3 WD humor test was studied in three samples employing two different intelligence tests (Ruch & Hehl, 1985) and a replication sample using a third intelligence test (Jochim, 1986). There are converging results showing that positive correlations occurred between intelligence and NON_f only, and negative correlations occurred between intelligence and $INC-RES_f$ and NON_a only. There was no correlation with $INC-RES_a$. Because only appreciation (but not comprehension) of humor was investigated, it is not possible to distinguish between the two hypotheses just presented. However, the results show that intelligence has to be considered in the prediction of appreciation of humor structure too. More importantly, partial correlation reveals that intelligence explains variance that is not covered by the other predictors (e.g., conservatism). Thus, its explicit consideration would increase the total amount of variance explained (Ruch & Hehl, 1985).

Appreciation of Humor Content

Although nearly all the studies trying to explain individual differences in appreciation of humor were related to the content aspect, and sexual humor has been the favorite content category, the determinants of appreciation of sexual humor are not known yet in contemporary literature. Whereas several hypotheses have been put forward (see Hehl & Ruch, 1985; Nias, 1981; Ruch & Hehl, 1986b, 1988, for a review), none of them could be verified unambiguously.

This might be due to two reasons. First, funniness rather than aversiveness scales were employed in cases where the hypotheses explicitly related to the *dislike* (and not reduced funniness only) of sexual humor.

Second, the failure might also be related to the neglect of acknowledging the existence of structure variance in sexual humor and its explicit consideration when testing the hypotheses. Studies investigating individual differences in appreciation of sexual humor have to consider that subjects do not respond to the content of these jokes and cartoons only but also to their structural properties. The sexual humor category is sometimes split up into the three categories of INC-RES SEX, NON SEX, and PURE SEX, and the assumption of a structural basis in sexual humor is validated by the correlation of these categories with predictors of the humor structure, or with the two structure categories themselves. Thus, whereas hypotheses about predictors of sexual humor were nearly exclusively related to the sexual content only, empirical tests of these hypotheses were always based on data containing the structure variance too, thus lowering the power of the test. In other words, whereas the *content factor* of sexual humor is orthogonal to the structure factors, the sexual humor *category* itself is not.

Two simple methods were used to roughly extract structure variance in sexual humor and relate the content to predictors only. First, factor scores of the sexual humor factor were considered to be a relatively pure measure of the appreciation of sexual content, because the structure variance of these jokes and cartoons contributes to the structure factors, as can be seen by their double loadings. Second, partial correlations were used to remove the variance of the structure as represented by the first two humor categories. For example, it was attempted to estimate the correlation between disinhibition and content variance in SEX_f only, by partialling out INC-RES_f and NON_f and thus holding the effects of the structure constant (Ruch, 1988).

Funniness of Sexual Content in Humor

Studies on appreciation of sexual content in humor using the 3 WD converge on the finding that the second dimension in the attitude space, tough-tendermindedness, is the most important predictor. Irrespective of the structure of the joke or cartoon, toughmindedness correlates positively with funniness and negatively with aversiveness of sexual humor (Ruch & Hehl, 1986b). The coefficients of correlation for the three subgroups of sexual humor are significantly positive and range between .28 and .46. This result could be found at the level of individual jokes and cartoons also. The correlation between toughmindedness and the 20 representatives of the sexual humor category were all positive for the funniness scale (with 15 of them being significant) and negative for the aversiveness scale (with 16 reaching significance). Furthermore, a higher order relationship was found. The higher funniness of a sexual joke or cartoon correlated with the two toughmindedness measures used, the higher its loading on the sexual factor.

The Phi coefficients computed turned out to be very high, .98 and .97, respectively. Finally, there was also evidence that toughmindedness is a predictor of contents other than sex. The sign of the loadings of jokes of the first factor (i.e., INC-RES humor) on the sexual factor (approximately 8.4% of variance) tended to correspond with the sign of these jokes' correlation with toughmindedness. In other words, the small amount of content variance in incongruity-resolution humor may be predicted by toughmindedness too.

Evidence for the hypothesis that toughmindedness is a predictor of content of sexual humor can be found in two former studies with the conservatism scale (Ruch, 1984; Ruch & Hehl, 1985). In a factor analysis of items of the German version of the Wilson and Patterson conservatism scale, it was found that the second factor was mainly correlated positively with the funniness and negatively with the aversiveness of sexual humor (Ruch, 1984). Furthermore, it was shown that antihedonism (which is a marker for tendermindedness) was the only subfactor of conservatism that was correlated negatively with the funniness and positively with the aversiveness of sexual humor (Ruch & Hehl, 1985).

Further support for the hypothesis that appreciation of sexual content in humor is located on the T-axis comes from studies with personality variables (Joachim, 1986; Ruch, 1988), sexual behavior and sexual attitudes (Ruch & Hehl, 1988), health-related attitudes (Hehl & Ruch, 1990), and values (Ruch & Hehl, 1987). In these studies, markers of toughmindedness correlated with appreciation of sexual humor. These correlations reflect both content and structure.

There are, however, also results relating to the content only, because the effects of structure were controlled by computing partial correlations. In detail, funniness of content in sexual humor was correlated positively with disinhibition in four samples. These data demonstrate the importance of controlling for the effects of structure, because the correlation with funniness of the sexual humor *category* was not significant in two of the four samples studied (Ruch, 1988). Furthermore, whereas a scale of sexual libido (Eysenck, 1976) was not correlated with funniness of incongruity-resolution-based sexual humor, a significant coefficient emerged after controlling the effects of the structure, which suggests a positive relationship between sexual libido and funniness of sexual content in humor (Ruch & Hehl, 1988).

The relationship between appreciation of sexual humor and disinhibition is especially noteworthy because it allows the derivation of a new hypothesis. Disinhibition is a subfactor of sensation seeking (Zuckerman, 1979). Items of this scale indicate seeking of stimulation through other persons; they express a need for variety in social life and other hedonic pursuits. Zuckerman (1984) suggested that disinhibition relates to the *intensity*

dimension of stimulation. Differences between high and low disinhibitors increase with increasing intensity of the stimulation. Sexual content represents one of the most intensive stimulations obtainable in humor. It can be assumed that high disinhibitors tolerate stimulation by highly tendentious humor as they tolerate intensive stimulation by other objects (Little & Zuckerman, 1986). Thus, one can expect that the size of the correlation between funniness of sexual humor and disinhibition will be higher for highly tendentious material and lower for more veiled forms of sexual humor. This was found to be true for toughmindedness on the higher order relationship aforementioned and should also be verified for disinhibition.

Thus, there is ample evidence for the hypothesis that appreciation of sexual content in humor reflects toughminded attitudes. Furthermore, it was argued that the toughmindedness hypothesis is a very parsimonious hypothesis, because it incorporates many other single specific hypotheses set up to explain individual differences in humor (Ruch & Hehl, 1988).

Appreciation of Sexual Humor Based on Different Structures

Sexual content is not funny by itself, because it is embedded in one or the other humor structure. Thus, whereas appreciation of sexual humor is located exactly on the T-axis, appreciation of the different subgroups of sexual humor will not be. Although the matter is far from being settled, there is evidence that content and structure of humor have *additive* influence on its perceived funniness (Ehrenstein & Ertel, 1978; Wilson, 1979). Thus, one could expect that the location of appreciation of the different humor categories can be predicted from the separate locations of their structure and humor content.

Indeed, funniness of *incongruity-resolution-based sexual humor* is correlated positively with both toughmindedness and conservatism. Given its location in the toughminded conservative diagonal, one would expect that other variables located in this quadrant are highly predictive of this subgroup of sexual humor (see Fig. 2.1). This could be found for such variables as intolerance of ambiguity, political and economic interests (Ruch & Hehl, 1987), technical interests, support for education toward submissiveness (Hehl & Ruch, 1990), low aesthetic and social interests (Ruch & Hehl, 1987), and low scores on the 16PF-M scale (bohemian unconcernedness; Ruch & Hehl, 1986b). Variables located in the toughminded *liberal* (or *radical*) quadrant (e.g., sensation seeking, permissiveness) are not expected to correlate with sexual humor based on the INC-RES structure, because appreciation of the content is suppressed by low appreciation of the structure. These variables share the toughmindedness component with INC-RES SEX_f but are on the opposite pole with

respect to the conservatism dimension. As shown earlier, disinhibition tends to be *negatively* related with INC-RES_f (see Table 2.6) but *positively* with funniness of sexual content, resulting in only slightly positive correlations with SEX_f (Ruch, 1988).

Funniness of *nonsense-based sexual humor*, on the other hand, also reflects the predictors of funniness of the general nonsense category. Because conservatism is not a potent predictor of funniness of nonsense, within this two-dimensional attitude space, NON SEX_f is located on the T-axis only (see Fig. 2.1), showing no alignment to the conservatism dimension (Ruch & Hehl, 1986b). However, among others, NON SEX_f is more highly correlated with scales of disinhibition and general sensation seeking (Ruch, 1988), hedonism and interest in sex (Hehl & Ruch, 1990), and sexual libido, sexual permissiveness, sexual pleasure, and sexual experience (Ruch & Hehl, 1988). In this subtype of sexual humor, two arousing properties fuse, the sexual content and the nonsense structure. This hypotheses can be confirmed by the fact that NON_f is also correlated to most of the aforementioned variables, albeit lower than NON SEX_f. Variables located in the toughminded conservative quadrant (i.e., the predictors of INC-RES SEX_f) most frequently are not correlated with funniness of sexual humor based on nonsense (Hehl & Ruch, 1990; Ruch & Hehl, 1987).

None of the variables predicting funniness of incongruity-resolution-based sexual humor has a direct salient link to sex, whereas the predictors of funniness of nonsense sexual humor do relate to positive attitudes to sex and sexual experience. Thus, the various forms of sexual humor differ with respect to their distance to the location of direct expression of sexual impulses. Eysenck and Wilson (1978) summarized that sexual freedom can be reliably located in this two-dimensional attitudes space in the toughminded radical quadrant. This could be confirmed with the Eysenckian superfactor in sexual attitudes, sexual libido, as well as with scales assessing sexual behavior (Ruch & Hehl, 1988). Whereas sexual libido is more closely related to the T- than to the C-axis, other scales, like sexual permissiveness, correlate with both radicalism and toughmindedness at about an equal size (see Fig. 2.1). None of the scales reflecting positive sexual attitudes was located outside this quadrant. Given the facts that scales of sexual freedom are located in the toughminded radical quadrant exclusively but none of the sexual humor categories are, it has to be stated that funniness of sexual humor does not directly reflect sexual freedom. Nonsense sexual humor is located closest (approximately 30° away) and thus is correlated with scales of sexual freedom. Sexual humor based on incongruity-resolution is very distant (approximately 80° away) and thus is not correlated. Personality variables located there do have relationships to sex albeit not to sexual freedom. The authoritarian personality as introduced by Adorno, Frenkel-

Brunswik, Levinson, and Sanford (1950) is located in the toughminded conservatism quadrant too. Among other components (e.g., conventionalism, authoritarian submission, authoritarian aggression, anti-intraception, power and "toughness," projectivity), authoritarians are characterized by an "exaggerated concern with sexual goings-on" (p. 157). According to the authors, the responses to the authoritarianism items relating to sex indicate the strength of the subject's unconscious sexual drives; scoring in the authoritarian direction reflects that the sexual desires are suppressed and in danger of getting out of hand. Maybe the observation of toughminded conservatives and their appreciation of sexual humor (based on incongruity-resolution) inspired Freud (1905) to put forward his repression theory of jokes.

Whereas the results for appreciation of sexual humor based on nonsense totally contradict Freudian theory of repressed sexuality, they also do not suggest that finding this humor funny is a sign of *mere* sexual libido or permissivity. More research is definitely needed on this problem. One shortcoming of the 3 WD is that there are only three sexual cartoons with a high nonsense loading included. Thus, the relationship between nonsense sexual humor and sexual attitudes and behavior should be investigated using a broader sample of jokes and cartoons. This should lead to a more stable location of this subgroup of sexual humor. However, the main findings obtained for nonsense sexual humor seem to be solid because the general nonsense humor category (which consists of 20 items) yielded similar patterns (i.e., the correlations with sexual libido, experience, and pleasure obtained for NON_f were only slightly lower than the coefficients of NON_{SEX_f}).

Aversiveness of Sexual Content in Humor

Given the fact that the two components of appreciation of humor, funniness and aversiveness, are substantially negatively correlated in sexual humor only (see Table 2.3), one can expect that predictors of funniness of sexual humor will also tend to predict its aversiveness (with a reversed sign). This was found for most of the predictors (e.g., toughmindedness, disinhibition, extraceptive values). In general, the coefficients tended to be even higher for aversiveness than for funniness. Furthermore, whereas SEX_f is related to the superfactor sexual libido only, SEX_a is related to low libido and low sexual satisfaction.

Finally, it should be mentioned that structure also codetermines the results of *aversiveness* of the subgroups of sexual humor. The predictors of aversiveness of sexual humor based on nonsense are quite different from the predictors of aversiveness of sexual humor based on incongruity-resolution (Ruch & Hehl, 1987, 1988).

DISCUSSION AND CONCLUSION

This review shows that the 3 WD humor test fulfills the criteria for several of the functions of humor tests described in the introduction. With respect to the first function, serving as a diagnostic tool for the assessment of appreciation of humor, the application of the 3 WD can be recommended on grounds of the satisfactory psychometric properties. Analyses of the test statistics on the scale and item level yield results comparable to other personality questionnaires. The validity studies confirm the significance of the proposed structure and content elements in the stimulus material and show the usefulness of the consideration of the negative responses to humor on a separate scale.

The differentiation between the two structures is validated by analyses of the ratings of perceived attributes as well as the correlations with predictor variables. Subjects scoring high in $INC-RES_f$ appreciate the resolution element in the processing of the punchline. For them it is important that the initial discrepancy or incongruity can be resolved completely and that no traces of residual tension/incongruity are left over. The existence of residual incongruity, however, plays a crucial role in the appreciation of humor of the nonsense type. For subjects scoring high in NON_f , the residual traces of incongruity enhance enjoyment of humor, whereas the high scorer in NON_a is characterized by low tolerance for unresolved incongruity in humor and a negative response to it. The results of the present review provide ample support for the view that appreciation of the structural basis of humor is embedded into a more general response pattern to simple-complex, incongruent-congruent, familiar-novel, predictable-unpredictable, consistent-varied, unambiguous-ambiguous, and other stimuli not limited to the realm of humor. It can be concluded that the tendency to seek out certain degrees of stimulus uncertainty and to avoid others as observable in general life extends to humor appreciation.

This chapter also validates the significance of the content in sexual humor; however, it also confirms the existence of structure variance in appreciation of this content-dominated humor category. Appreciation of the sexual content seems to reflect the *degree* and *valence* of salience of this theme (i.e., strength of positive salience contributes to funniness and strength of negative salience contributes to aversiveness of sexual content in humor). Thus, the degree of appreciation of the sexual content in humor varies *directly* with one's attitudes to sex and sexual behavior rather than *inversely*, as deducible from Freudian theory. However, there is little understanding of the differences in the functions of the incongruity-resolution structure and the nonsense structure in which the sexual content can be embedded.

Finally, the review supports the validity of the separation of positive and

negative responses to humor. The funniness scale covers the degree of positive responses to the stimulus, ranging from no positive response elicited to strong enjoyment. The aversiveness scale covers the responses ranging from tolerance to explicit dislike of the stimulus. Whereas there is no evidence for a strong generalized proneness to find all types of humor funny, such individual differences exist with respect to aversiveness. General proneness to negative affectivity and tenderminded attitudes are factors associated with a low threshold for negative responses to all forms of humor.

Whereas the psychometric properties of the 3 WD humor tests are satisfactory in general, attention should be given to the problems relating to the skewness of the aversiveness scales, the unequal distribution of structure among the sexual items, and the potential involvement of state variance. The skewness of the aversiveness scale is based on the low rate of negative responses that, however, seems to be inherent in the nature of the stimuli. Humor is invented for the amusement or exhilaration of individuals, not for their displeasure. Whereas the funniness rating reflects the more common response to humor, the aversiveness aspect is considered to be an important supplement. One peculiarity of humor tests is that the items cannot be changed in order to get better statistics. Whereas in items measuring personality traits the endorsement frequency can easily be influenced (e.g., by making statement more or less extreme), such manipulations are hardly effective with humor items because one can assume that the joke is already in the shape that assures maximum funniness. An effective reduction of the skewness would be obtained by raising the number of items, including more aversive items, or replacing "aversiveness" by a less negative term. However, all three changes would impose new problems and hence the scales are left as they are.

A possible revision of the 3 WD should take into account the structural basis of sexual humor more explicitly, which, in the present versions, is not balanced. There are more items based on incongruity-resolution than on nonsense. Whereas this reflects the distribution frequency of the two structures in humor in general, the resulting score in the 3 WD is biased toward INC-RES SEX humor. Thus, if a study demands explicit consideration of the structural basis, the use of separate scores for the three subcategories of sexual humor is recommended.

Finally, doubts remain whether the precautions made did lead to a *complete* elimination of the state variance. These doubts are based on the somewhat lower parallel test reliability coefficients for samples with a longer time lag as compared to those with no time lag, and on the varying size of the mean intercorrelation among the three funniness and aversiveness scales. This problem needs a thorough consideration. Future investigations should try to estimate the amount of state variance in humor appreciation,

to figure out their causes, and finally to test how state influence could be minimized or eliminated. Studies should be carried out exploring the effects of situational factors (e.g., alone vs. group administration, experimenter present or not). Special attention should also be given to the type of instruction; given that an explicit variation of state-trait instructions (how funny/aversive *at the moment* vs. *in general*) would yield strong effects, the state elements in the current instruction should be eliminated completely. However, remember that the aforementioned problems are not reflecting particular weaknesses of the 3 WD but the lack of knowledge with respect to optimal administration conditions for humor tests in general. Furthermore, there exist alternative explanations (e.g., the positive intercorrelations among the funniness scales might also be related to sample selection; i.e., there were lower intercorrelations in the more representative samples).

None of the studies carried out with the 3 WD directly dealt with the second function of a humor test, the potential use of humor appreciation as an objective test of personality. A necessary prerequisite for serving this function is the proof that there are not only consistent but also substantial correlations between humor and personality, evidence that Cattell and Tollefson (1966) failed to give for their IPAT Humor Test of Personality. According to the present review, conservatism-radicalism might be such a dimension that could be assessed via a humor test. Whereas the zero-order coefficients between conservatism and INC-RES_f do not exceed .50, the size of the coefficients increases to .60 (Ruch, 1984; Sample II), if funniness of the nonsense and sexual humor categories are considered too. A coefficient of .65 was obtained in a canonical correlation approach employing four conservatism measures as criterion and the scales of the 3 WD (both forms; including the aversiveness scales) as predictors (Ruch & Hehl, 1986a). The highest coefficient (.79) was obtained in a multiple regression approach, with funniness of *single* jokes and cartoons used as predictors. Thus, whereas conservatism is most highly correlated with INC-RES_f, consideration of the other scales would probably yield more substantial coefficients.

The zero-order coefficients between funniness of sexual humor and toughmindedness do not suggest a strong relationship. However, the coefficients would increase once the structural variance is eliminated and the aversiveness scales are employed too. For example, a correlation coefficient of .51 was obtained for a canonical variate, linking SEX_f and general aversiveness (on the predictor side) and the tough-tendermindedness bias of some conservatism scales (on the criterion side; Ruch & Hehl, 1986a). The zero-order coefficients prohibit the use of the 3 WD scales as a diagnostic tool for the assessment of sensation seeking. However, there is increasing evidence that sensation seeking is a predictor of the *relative* preference for nonsense over incongruity-resolution humor, irrespective of the degree of appreciation, and these coefficients are consistently higher.

When evaluating the size of the coefficients, with a few exceptions only, none of the samples was representative. Student samples certainly do not cover the whole range of variance in traits like conservatism, sensation seeking, or toughmindedness, suggesting an underestimation of the size of the coefficients of correlation. Furthermore, consider that reliability and validity of the criterion measures are far from being perfect, too. Thus, studies set out to estimate the 3 WD as an instrument for the objective assessment of personality traits should try to use representative samples and multiple operationalizations of the criteria. Given that these precautions are taken, one can estimate from the results of such studies whether the application of the 3 WD humor test as a means for the objective assessment of personality is justified.

Definitely more research should be carried out with the lines of the function of humor tests as a means for establishing a taxonomy of humor and for testing its comprehensiveness and cross-cultural stability. An accepted taxonomy of humor could serve as a frame of reference, allowing the integration of the different findings, and would thus lead to progressive accumulation of knowledge on humor. Experience gathered with the studies done with the 3 WD suggests that the application of translated humor items in other countries is possible. The factor structure and the personality correlates were replicable. Whether the taxonomy underlying the 3 WD humor test is comprehensive or not is open for empirical investigation. Only extremely demeaning and intolerable ethnic jokes and cartoons were intentionally excluded from the original item pools. Thus, the resulting taxonomy should be quite representative for humor printed in the Austrian and German media. Furthermore, many of these jokes and cartoons do not have a German origin. Humor books are translated into different languages, and also international magazines are vehicles for transporting humor from one culture to another, supporting the assumption that universal humor factors are stable across different cultures. Furthermore, the strong association with personality traits and their cross-cultural replicability supports such an assumption. Nevertheless, it cannot be excluded that additional factors will appear in different nations. One has to be careful, however, to have representatives of the discussed taxonomy into the factored item pool in order to be able to estimate whether a factor is new or not. Explicit consideration of pure representatives of the two structural factors is especially important when attempting to verify new content factors. When attempting to test the exhaustiveness of the derived taxonomy, it turned out that the content categories of aggressive, black, and scatological humor based on either incongruity-resolution or nonsense correlated so highly with the "innocent" representatives of the respective structure factor that it did not make sense to separate them (unpublished

study). Whereas the item pool of the 3 WD can serve as a basis for replicating the factors in different cultures, it might be necessary to replace some items by ones of the respective countries because of unfamiliar physical characteristics of the persons portrayed.

The utility of the 3 WD with respect to the other functions of humor tests depends on the degree of exhaustiveness of the underlying taxonomy. In this context the present inventory would be applied to test the effects of personality, mood, or of other factors on the appreciation of humor. Prior attempts to validate personality factors in humor were predisposed to fail, because very frequently humor categories with unproven empirical homogeneity were used or the hypotheses related to postulated aspects of jokes or cartoons, which in humor research were not proven to have effects on the perceived funniness. Consequently, the interest of personality theorists in humor ceased. Because humor research is much more advanced now and humor tests exist that are based on theory, the field will become attractive to personality research again.

The use of the 3 WD can be recommended for testing hypotheses relating to the functions and effects of humor as stated in different humor theories. For example, over the last decade there exists an increasing number of articles speculating about the health benefits of humor and laughter (e.g., humor is seen as a stress and pain reducer, a coping device, or a means to enhance immune functioning). Studies testing such hypotheses employed a unidimensional concept of humor (i.e., the subjects were divided into subgroups of "high" or "low" in sense of humor according to their score on *one* scale only). Application of the 3 WD would lead to a refinement of these global hypotheses by specifying which of the humor categories are involved in the effects and which ones are not. Pilot studies relating the 3 WD to health variables suggest that nonsense is better than incongruity-resolution, whereas aversiveness of all categories is related to many self-reported disturbances.

Finally, the items of the 3 WD might also be used in emotion research as a standardized method for the induction of positive affect. When serving this purpose, the items are presented to subjects in the form of a series of slides, and an explicit state instruction is used. Furthermore, besides the verbal ratings, behavioral responses are also assessed.

Because humor is related to many psychic phenomena, there is a need for a standardized humor test in several fields within psychology. One aim of this chapter is to draw the attention of personality research to this field again; decades ago, humor was an integrated field of inquiry for personality psychology. The picture that psychology draws of man will remain particularly incomplete, if such a genuine human ability like the appreciation of humor remains a missing element.

SUMMARY

Research relating to the construction and validation of the 3 WD Humor Test (Ruch, 1983) is reviewed. A two-modal taxonomy of humor is proposed covering three stimulus factors of incongruity-resolution humor, nonsense humor, and sexual humor, and two response dimensions of funniness and aversiveness. This chapter presents: (a) a review of studies aimed at developing the taxonomy and testing its cross-national stability; (b) psychometric properties of the scales; and (c) an evaluation of the hypotheses regarding the existence and nature of two different humor structures, the significance of the humor content, and the validity of the separation of the funniness and aversiveness aspects in the appreciation of humor based on a review of studies conducted in four nations. In validity estimates, special attention is given to the correlations of the 3 WD scales with measures of conservatism, toughmindedness, sensation seeking, and intolerance of ambiguity. The results demonstrate a close interlocking between appreciation of humor and personality. A potential use of the humor test as a means for the objective assessment of personality traits is discussed. The review of the studies also demonstrates several unresolved issues in the assessment of the appreciation of humor.

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